AD-A091 275 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. FRESH AIR FUND DAM NUMBER 2 (INVEN--ETC(U)
SEP 80 E O'BRIEN DACW51-79-C-0001

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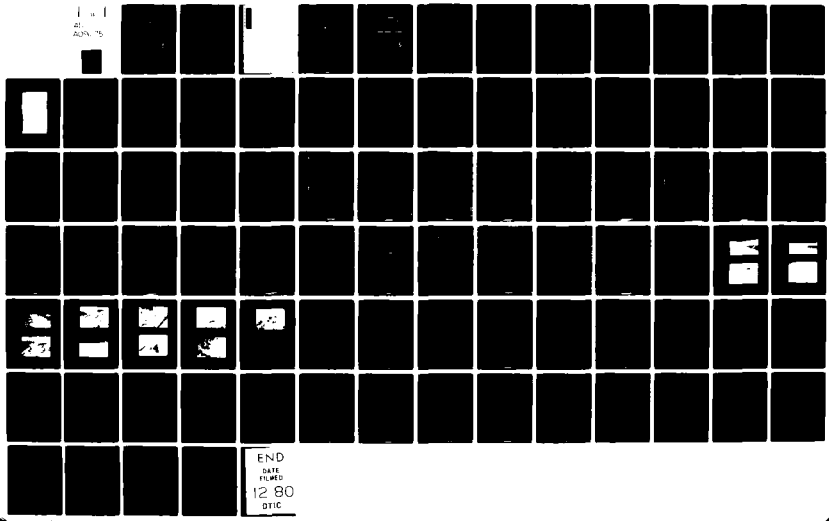

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Fresh Air Fund Dam No. 2
Hudson River Basin, Dutchess County, NY
Inventory No. 726

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Fresh Air Fund Dam No.2
Dutchess County
Fishkill Creek
Hudson River

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and visual inspection of the Fresh Air Fund Dam No. 2 and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required only 41 percent of the spillway outflow capacity. The spillway capacity is therefore adjudged as adequate.

The following remedial measures should be performed within one year from notification:

- Regrade depressed area at the right abutment contact
- Observe wetness at downstream toe of embankment. If flow increases a significant amount, it should be monitored at biweekly intervals with the aid of weirs
- Clean debris and vegetation from the downstream spillway channel, outlet basin, auxiliary spillway channel and embankment surfaces. Provide a program of periodic mowing and cutting of these structures
- Fill depressions and low areas along crest and downstream slope. Monitor for signs of future depressions
- Repair trash racks and clean riser intake chamber
- Recoat exposed reservoir drain pipe with bituminous material
- Mark gate valve stem screw to designate the complete closure of reservoir drain gate
- Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the reservoir drain. Document this information for future reference. Also develop an emergency action plan

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(1)

Number

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(6) National Dam Safety Program.

FRESH AIR FUND DAM NO. 2

(Inventory Number NY726), Hudson River Basin,

DUTCHESS COUNTY, NEW YORK

~~INVENTORY NO. N.Y. 726~~

PHASE I INSPECTION REPORT

~~NATIONAL DAM SAFETY PROGRAM~~

(10) Eugene O'Brien

(11) 12 Sep 80

(12) 84

(15) DACW51-77-C-0001

NEW YORK DISTRICT CORPS OF ENGINEERS

AUGUST 1980

393970

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C., 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
FRESH AIR FUND DAM NO. 2
I.D. NO. N.Y. 726
D.E.C. NO. 212D-3254
HUDSON RIVER BASIN
DUTCHESS COUNTY, NEW YORK

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APPENDICES

A. PLATES

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Fresh Air Fund Dam No. 2
State Located:	New York
County Located:	Dutchess
Stream:	Fishkill Creek
Basin:	Hudson River
Date of Inspection:	24 April 1980

ASSESSMENT

Examination of available documents and visual inspection of the Fresh Air Fund Dam No. 2 and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required only 41 percent of the spillway outflow capacity. The spillway capacity is therefore adjudged as adequate.

The following remedial measures should be performed within one year from notification:

- Regrade depressed area at the right abutment contact
- Observe wetness at downstream toe of embankment. If flow increases a significant amount, it should be monitored at biweekly intervals with the aid of weirs
- Clean debris and vegetation from the downstream spillway channel, outlet basin, auxiliary spillway channel and embankment surfaces. Provide a program of periodic mowing and cutting of these structures
- Fill depressions and low areas along crest and downstream slope. Monitor for signs of future depressions

- Repair trash racks and clean riser intake chamber

- Recoat exposed reservoir drain pipe with bituminous material

- Mark gate valve stem screw to designate the complete closure of reservoir drain gate

- Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the reservoir drain. Document this information for future reference. Also develop an emergency action plan

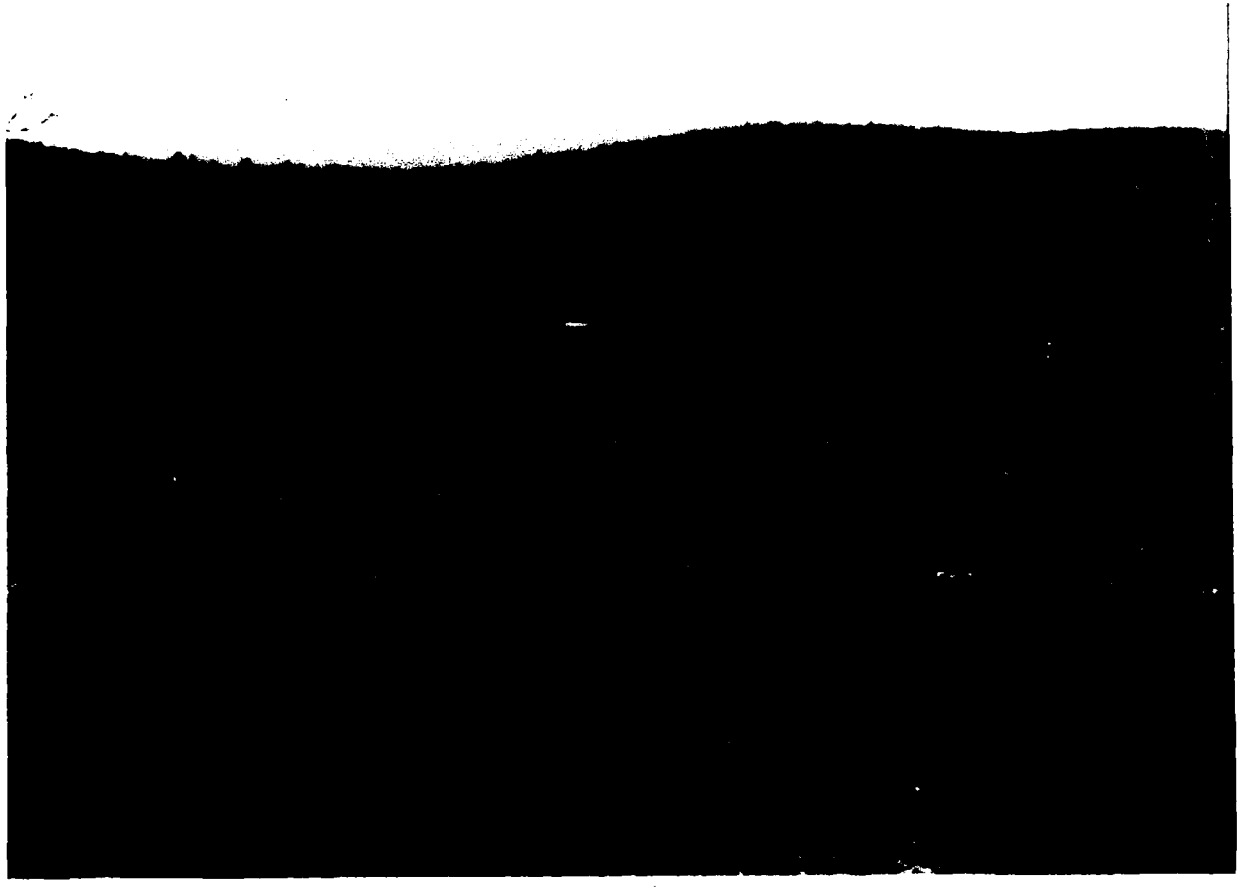
Eugene O'Brien

Eugene O'Brien, P.E.
New York No. 29823

Approved by:

Col. W. M. Smith, Jr.
New York District Engineer

Date: 12 Sep 80



GENERAL OVERVIEW OF DAM

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
FRESH AIR FUND DAM NO. 2
I.D. NO. N.Y. 726
D.E.C. NO. 212D-3254
HUDSON RIVER BASIN
DUTCHESS COUNTY, NEW YORK

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the State of New York, Department of Environmental Conservation by a letter dated 7 January 1980, in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367, dated 8 August 1972.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF THE PROJECT

a. Description of Dam and Appurtenances

The New York Herald Tribune Pioneer Fresh Air Fund Dam No. 2, presently known as the Fresh Air Fund Dam No. 2, is an earth embankment approximately 1100 feet long, with a maximum height of about 47 feet and a crest width of 17 feet. The grassed downstream slope varies from approximately 1V:2.5H to 1V:3.0H. The upstream slope is 1V:3H, partially protected by riprap to within 15 feet of the crest edge, and grassed from the top of riprap to the crest.

According to available contract drawings (Plates 2 to 11), the embankment consists of essentially two zones of material: an upstream zone consisting of a sandy clay, and a downstream zone consisting of a clayey sand and gravel.

A 36-inch diameter reinforced concrete pipe located near the left abutment serves as the principal spillway for the dam. As indicated on the drawings, the pipe is approximately 90 feet long and is founded on a concrete cradle tied to underlying bedrock with dowels. A rectangular intake

structure (2 feet wide by 5 feet long) is located at the upstream end of the spillway pipe. The structure is constructed of reinforced concrete, has an overflow at El 1040, and is equipped with trash racks.

A riprap protected stilling basin collects spillway discharge. The basin is approximately 50 feet long and has a mid-height width of about 30 feet. Flows exit the basin through an 8 foot wide channel, which, in turn, flows into a natural channel.

An excavated auxiliary spillway channel is located at the right abutment. The channel is approximately 30 feet wide at the base, 6 feet high, and has 1V:3 to 4H side slopes.

A 12-inch diameter corrugated steel reservoir drain is located at the approximate center of the dam. Discharge is controlled by a manually operated center rising screw-type valve, which is supported by a concrete platform approximately 10 feet from the upstream crest edge. The valve controls an inclined sliding intake gate located at the pipe inlet. The gate stem is housed in a protective pipe, which is embedded in and parallel to the upstream slope and is supported by regularly spaced concrete blocks.

A berm exists along the downstream toe of the embankment. The berm is approximately 25 feet wide and has an approximate 1V:3H downstream slope.

According to the contract drawings, a seepage drain (8-inch diameter steel pipe) extends eastward from the service spillway, approximately paralleling the embankment crest. Flow exits the pipe adjacent to the reservoir drain along the downstream slope of the berm.

b. Location

The dam is located on the Sharpe Reservation, Dutchess County, New York. The dam is approximately 2 miles southeast of the intersection of N.Y. State Route 9 and Interstate 84.

c. Size Classification

The dam is 47 feet high and the reservoir has a storage capacity of 594 acre-feet. The dam is classified as "intermediate" in size (40 to 100 feet in height).

d. Hazard Classification

The dam is classified as high hazard due to the large number of camp housing and recreational facilities located approximately 0.25 mile downstream.

e. Ownership

The dam is owned and operated by the Fresh Air Fund located at 300 West 43rd Street, New York City, New York, 10036, Tel. (212) 589-0200.

f. Purpose of Dam

The Fresh Air Fund Dam No. 2 creates a recreational pool for fishing, swimming and boating.

g. Design and Construction History

The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service. For this inspection, a set of contract drawings was provided by the owner. "As-built" dam cross sections, geotechnical design and analysis data, and supervision of construction reports can be found at the Camp Operations Center, located at the main gate to the Reservation. The dam was constructed in 1966; the Contractor's name is unknown.

h. Normal Operating Procedure

Water release from the lake is through the 36-inch RC outlet pipe. As reported by Mr. Seitz, Superintendent of Maintenance, until the time of this inspection, the low level outlet had not been operated.

1.3 PERTINENT DATA

a. Drainage Area — 197 acres

b. Discharge at Damsite

Maximum Known Flood at Damsite	Unknown
Auxiliary Spillway	
Maximum Pool (Top of Dam)	1535 cfs
Principal Spillway	
Maximum Pool	165 cfs
Total Spillway Capacity at Maximum Pool Elevation	1700 cfs

c. Elevation (U.S.G.S. Datum)

Top of Dam	1047 feet
Maximum Pool	1047 feet
Normal Pool	1040 feet
Spillway	
Upstream Invert	1032.5 feet
Downstream Invert	1029.5 feet
Riser Crest	1040 feet
Auxiliary Spillway Crest	1042.5 feet

d. Reservoir

Length of Normal Pool	2200 feet
Length of Maximum Pool	2300 feet

e. Storage

Normal Pool	594 acre-feet
Maximum Pool	870 acre-feet

f. Reservoir Surface

Normal Pool	44 acres
Maximum Pool	48.6 acres

g. Dam

Type	Earth
Length	1100 ± feet
Maximum Height	47 ± feet
Top Width	17 feet
Side Slopes (V:H)	
Upstream	1:3
Downstream	1:2.5 to 3.0

h. Reservoir Drain

Type	Steel Pipe
Diameter	12-inch
Closure	Inclined center rising screw gate valve

i. Service Spillway

Type	Reinforced Concrete Pipe
Diameter	36-inch
Location	Near Left Abutment
Support	Concrete Cradle
Upstream	Rectangular Concrete Intake Structure
Downstream	Riprap Stilling Basin

j. Auxiliary Spillway

Type	Excavated Channel
Base Width	30 feet
Height	6 feet
Side Slopes	1V:4H
Location	Left Abutment

SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

Fresh Air Fund Dam No. 2 is located in the Hudson Valley Section of the Newer Appalachians Physiographic Province. The bedrock in the section consists of strongly folded beds of shale and limestone of Ordovician Age. The valley lowland areas has low relief, which rarely exceeds 100 feet. Much like the typical Appalachian topography, the area consists of zig-zag ridges, and trellis drainage developed upon pitching anticlines and synclines (Ref. 8).

2.2 SUBSURFACE INVESTIGATION

Limited subsurface investigation information is available for the project. Test pit profiles at the borrow locations indicate that the local soil is dense glacial till consisting mostly of sand with some gravel, with variable depth to bedrock. Bedrock and/or boulders exist at the right abutment and auxiliary spillway channel.

2.3 DESIGN RECORDS

The records available for the project consist of eleven contract drawings which show the plans, sections and details of the dam and appurtenant structures, and a design report issued by the U.S. Soil Conservation Service dated February 4, 1957. Geotechnical records, including compaction, grain-size and triaxial data, stability analysis results and quantity estimates are available at the Camp Operations Center, Sharpe Reservation, Fishkill, New York.

2.4 CONSTRUCTION RECORDS

Construction records are available at the Camp Operations Center. Construction specifications, prepared by the U.S. Soil Conservation Service, are also available at the Center.

As reported by Mr. Seitz, during construction it was decided that the original design height (65 feet) of the dam would be changed to its present height (47 feet). A result of this design modification during construction was the formation of the existing downstream berm.

2.5 OPERATION RECORDS

According to Mr. Seitz, no written maintenance or operation records exist for the project.

2.6 EVALUATION OF DATA

Information obtained from the design drawings and a personal interview with Mr. Seitz is consistent with observations made during this inspection. The information obtained from available data was considered adequate for the Phase I inspection and evaluation.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

A visual inspection of Fresh Air Fund Dam No. 2 was made on 24 April 1980. The weather was clear and the temperature in the mid-fifties. At the time of the inspection, the lake level was about 1 inch above the intake structure crest elevation.

b. Dam

The earth embankment appears to be in good condition. The vertical and horizontal alignment of the crest appear to be good (See Photographs Nos. 1 and 3). The downstream edge of the crest shows signs of vehicular traffic. Bramble bushes have been planted approximately 5 foot on center along the crest.

The upstream slope shows no signs of erosion and only minor localized sloughing. The riprap zone appears durable and in good condition (See Photograph No. 11). Tall reeds and shrubs (6 to 8 feet tall) are growing in the riprap near the right abutment.

The downstream slope of the dam appears to be in good condition (See Photograph No. 4). There is little to no evidence of erosion along the slope, apparently due to the thick mat of overlying grass. Bramble bushes are located on the slope and downstream berm.

An area located along the downstream berm, approximately 200 feet left and right of the reservoir drain, showed signs of dampness and surface softness. It is uncertain whether the dampness is due to minor seepage or puddling (of downstream runoff) in vehicular tracks. Approximately 100 feet right of the spillway pipe are located two (2) small depressions (See Photograph No. 13), which could be due to erosion or burrowing animals.

c. Service Spillway

The condition of the spillway appears to be good (See Photograph No. 5). The concrete is intact both within the pipe and on the exposed surface, as is the exposed downstream cradle. The downstream cradle is protected by riprap which appears durable and in generally good condition, but cluttered with some wood debris. No seepage was found around the spillway pipe and cradle.

The sides of the stilling basin are protected with riprap (See Photograph No. 6) which appears to be in good condition. The basin bottom shows little sign of sedimentation.

The intake structure appears to be in good condition (See Photograph No. 7). The trash rack angle irons show some signs of deterioration, and have broken loose in two places. Some boulders and twigs were seen at the bottom of the intake structure.

d. Auxiliary Spillway

The auxiliary spillway appears to be in good condition (See Photograph No. 8). Exposed bedrock and/or boulders were noted at its base and left slope side. Small trees and bushes are located within the downstream channel.

e. Appurtenant Structures

The concrete of the gate operating structure appears to be in good condition (See Photograph No. 10). The valve was operated during this inspection to determine its operability and whether the reservoir drain was clear. The lifting of the gate and the outlet discharge appeared normal. When closing the gate it was determined that the gate can be set below its fully closed position, thereby allowing water to enter above the gate. The crank wheel to operate the valve is located at the Camp Operations Center.

The exposed portion of the reservoir drain at its discharge location is coated with a bituminous material which has deteriorated.

f. Downstream Channel

The downstream channel of the service spillway is a relatively narrow channel extending farther downstream into a relatively wooded area. At some locations the channel is cluttered with decayed and fallen trees (See Photograph No. 12).

g. Reservoir

The reservoir is bordered by Reservation property which is mostly undeveloped, aside from a few camp affiliated centers. Side slopes adjacent to the reservoir are relatively flat, wooded and show no signs of movement. There are no visible signs of sedimentation problems in the reservoir area.

h. Abutments

No seepage was observed at either the left or right abutments. At the right abutment there exists an unpaved service road which extends from reservoir rim, across the embankment crest, down the downstream slope, and for some distance along the downstream toe. It appears that at the intersection of the road and the embankment crest, there is a portion of the crest which is lower than elsewhere along the crest. Under high reservoir levels flow may occur at this contact and be diverted along the downstream toe of the embankment, causing erosion of the toe.

3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of the inspection did not indicate any serious problems which would adversely affect the adequacy of the dam and appurtenant facilities. The following is a summary of the problem areas encountered, in order of importance, with the appropriate recommended action:

1. The depressed area at the right abutment contact should be regraded to provide a level surface.

2. The wetness observed at the toe of the downstream slope should be investigated. This wetness should be observed on a bi-weekly basis and if flow increases to a significant amount, it should be monitored at bi-weekly intervals with the aid of weirs.

3. The debris and vegetation from the downstream channel, outlet basin, and auxiliary spillway channel should be removed. Provide a program of periodic inspection and removal.

4. Remove the brush on the embankment slopes, on the crest, and at the downstream toe. Provide a program of periodic cutting and mowing of the embankment surfaces.

5. The depressions along the crest and downstream slope of the embankment should be filled in with well compacted material. Monitor the embankment surfaces for future depressions.

6. Repair trash rack and clean riser intake structure.

7. Recoat exposed reservoir drain pipe with bituminous material.

8. Mark gate valve stem screw to designate the complete closure of reservoir drain gate.

9. Develop an emergency action plan for the project.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

No written operation and maintenance procedures exist for the project. The normal operation of the project consists of allowing water to flow through the service spillway outlet pipe. It is reported that the reservoir drain is never used.

4.2 MAINTENANCE OF DAM

It is reported that maintenance of the dam is performed when the need arises. Maintenance is not considered adequate as evidenced by trash racks, trees and brush, depressions, etc.

4.3 WARNING SYSTEM IN EFFECT

No warning system is in effect or in preparation.

4.4 EVALUATION

The overall condition of the dam and appurtenant structures appears to be good. Recommendations in connection with regular maintenance are discussed in Section 7.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The drainage area contributing to the Fresh Air Fund Dam No. 2 is 197 acres (0.31 square miles) and is located at Lat. 41°30' and Long. 73°52' (Hydrologic Unit Code 02020008). The pond is approximately twenty-two (22) percent of the total basin area (44 acres) with a length to width ratio of about 1.5 to 1. The drainage area is mostly undeveloped except for the camp facilities. The wooded slopes are fairly steep and there is little storage available over the basin.

5.2 ANALYSIS CRITERIA

Because of the small drainage area size and its short time of concentration, it was assumed that basin runoff would equal the excess rainfall. The Probable Maximum Precipitation (PMP) was taken from Hydromet Report No. 51 (Ref. 4) and was distributed over 24 hours by the standard EM-1110-2-1411 method (Ref. 3) and converted to runoff. Total rainfall losses over the land area was estimated as 4 inches (0.167 inches/hour). No losses were calculated for rain falling on the lake. The computed inflow hydrograph was input directly and the analysis was performed using the Corps of Engineers computer program, "Flood Hydrograph Package (HEC-1) for Dam Safety Investigations" (Ref. 1).

5.3 SPILLWAY CAPACITY

The principal spillway for the dam is a 36-inch diameter reinforced concrete pipe located near the left abutment. The pipe is approximately 90 feet long and is founded on a concrete cradle. The intake structure is a reinforced concrete riser with crest at El 1040.

A riprap protected stilling basin collects spillway discharge. The basin is approximately 50 feet long and has a mid-height width of about 30 feet. Flow exits the basin via an 8 foot wide riprapped lined channel.

An excavated auxiliary spillway channel is located at the left abutment. The channel is approximately 30 feet wide at the base, 6 feet high, and has 1V to 3 to 4H grassed side slopes.

The computed maximum capacity of the spillway with the water surface at El 1047, equivalent to the top of the dam, is 165 cfs. At this elevation, the capacity of the auxiliary spillway is 1535 cfs.

5.4 RESERVOIR CAPACITY

The normal capacity of the reservoir at El 1040 (spillway crest elevation) is listed as 594 acre-feet (Ref. 5). The surcharge storage between the crest of the spillway (El 1040) and the top of the dam (El 1047) is computed to be 376 acre-feet, which is equivalent to 22.9 inches of runoff over the entire basin. This substantial surcharge storage is sufficient to store the estimated PMP of 22.4 inches.

5.5 FLOODS OF RECORD

There are no records of floods available for the project.

5.6 OVERTOPPING POTENTIAL

The potential of the dam being overtopped was investigated on the basis of the spillway discharge capacity and the available surcharge storage to meet the selected design flood inflow.

The Probable Maximum Flood (PMF) routed through the lake caused the lake surface to rise to El 1043.6, which is approximately 2.5 feet below the top of the dam. The computed PMF peak inflow and outflow discharges were 1430 cfs and 702 cfs, respectively. The one-half PMF routed through the lake caused the lake surface to rise to El 1041.9, or approximately 5 feet below the top of dam. The peak outflow discharge was 300 cfs.

5.7 EVALUATION

The dam has sufficient spillway capacity to pass one-half and the full PMF without overtopping the dam. The spillway capacity is therefore assessed as adequate.

SECTION 6 - STRUCTURAL STABILITY

6.1 VISUAL OBSERVATIONS

Visual observations did not indicate any structural problems with the embankment or appurtenant structures with the reservoir at its present level. There are no adverse conditions which would affect the stability of the dam at the present time.

6.2 DESIGN AND CONSTRUCTION DATA

Design computations and construction records have been located at the Camp Operations Center.

6.3 OPERATING RECORDS

There are no operating records kept. There are no records or reports of any operational problems which would affect the stability of the dam.

6.4 POST-CONSTRUCTION CHANGES

There are no recorded post-construction changes. However, according to Mr. Seitz, the embankment height was modified during construction.

6.5 SEISMIC STABILITY

In accordance with recommended Phase I guidelines, the dam is located in Seismic Risk Zone No. 1. However, based on past local seismic experience, the New York State Geological Survey recommended that the damsite is to be considered in Zone 2. In accordance with the guidelines, a stability analysis is beyond the scope of work.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Examination of the available documents and visual inspections of the Fresh Air Fund Dam No. 2 and appurtenant structures did not reveal any conditions which constitute a hazard to human life or property. The earth embankment is considered to be stable under present conditions.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped for one-half and the full PMF. The principal and auxiliary spillway capacity are, therefore, adjudged as adequate.

b. Adequacy of Information

This report and its conclusions are based on visual inspection, interview data, contract drawings, and office hydrologic/hydraulic studies. This information and data are adequate for a Phase I inspection.

c. Need for Additional Investigations

No additional investigations are required for the project.

d. Urgency

All remedial actions described below should be completed within one year of notification to the owner.

7.2 RECOMMENDED MEASURES

The recommended improvements are as follows:

a. The crest should be regraded to fill depressions and provide a level surface, particularly at the right abutment contact.

b. Wetness and softness along downstream toe of the dam should be observed, particularly at high reservoir levels. Vehicular traffic should be excluded from the toe of the embankment. If flow increases to a significant amount, it should be monitored at bi-weekly intervals with the aid of weirs.

c. The debris and vegetation should be cleared from the downstream channel, outlet basin, auxiliary spillway channel and embankment surfaces. A program of periodic mowing and cutting of the embankment and outlet channels should be provided.

d. The two depressions along the downstream slope should be filled in with stone and monitored for seepage potential and future subsidence.

e. Repair of trash racks and remove debris from intake structure.

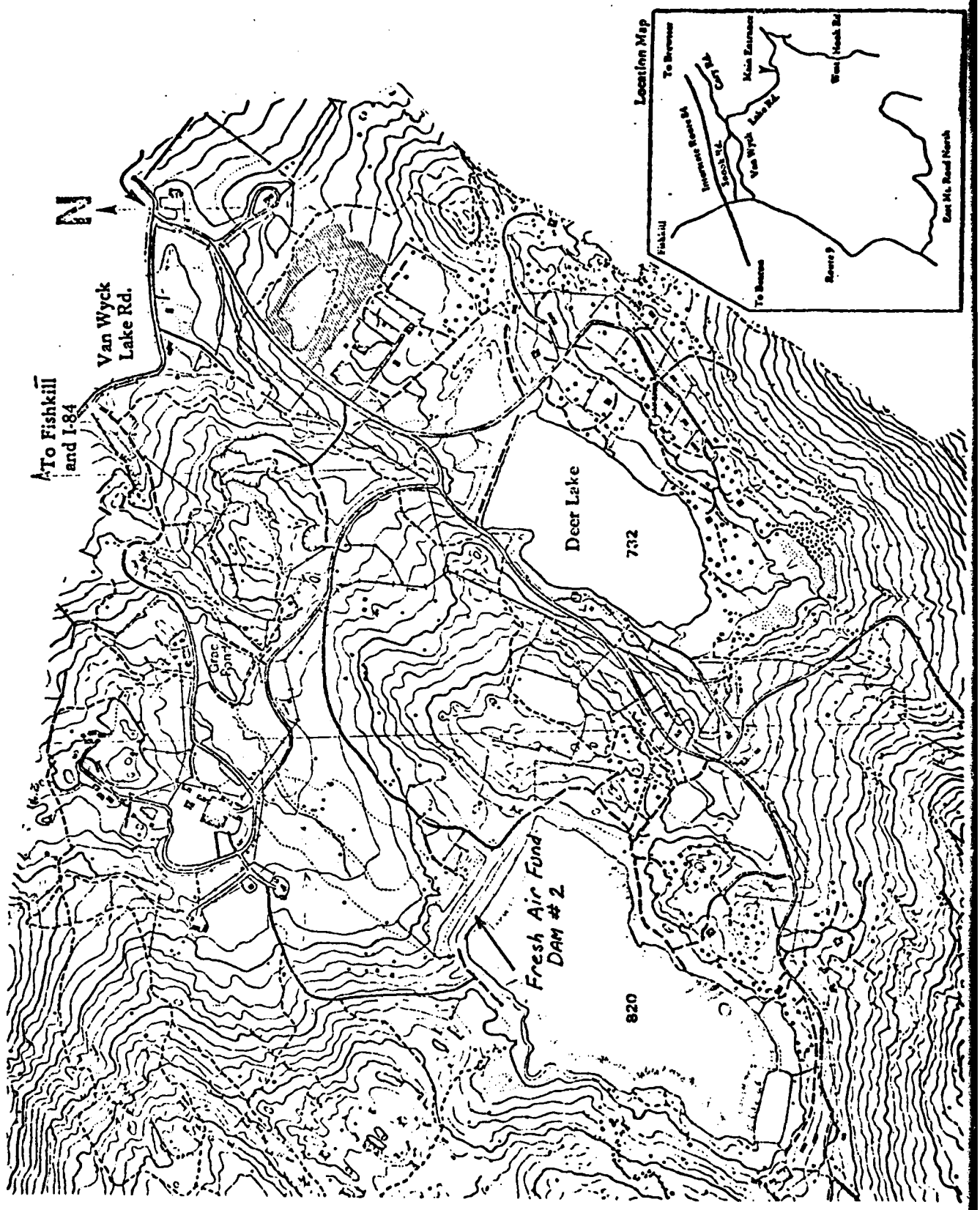
f. Recoat exposed reservoir drain pipe with bituminous material.

g. The gate valve stem screw should be marked to designate the position for complete closure of the outlet pipe.

h. Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the reservoir drain. Document this information for future reference. Also develop an emergency action plan.

APPENDIX A

PLATES

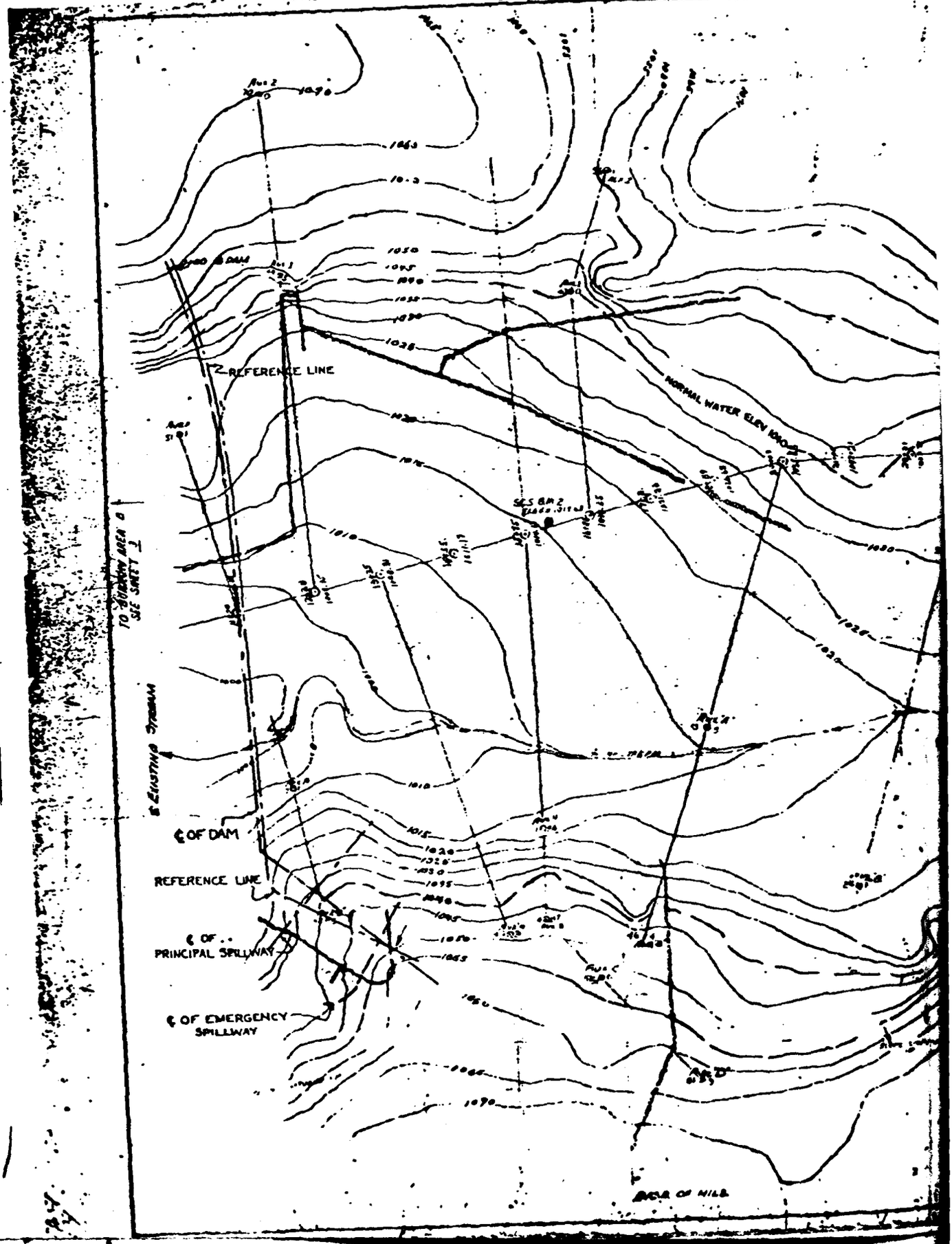


SCALE

0 1/8 1/4 MILE

FRESH AIR FUND DAM #2
TOPOGRAPHIC AND LOCATION MA

PLATE NO. 1


REFERENCE LINE
NORMAL WATER ELEV 1000
TO DRAINAGE AREA B
SEE SHEET 2
EXISTING STREAM
℄ OF DAM
REFERENCE LINE
℄ OF PRINCIPAL SPILLWAY
℄ OF EMERGENCY SPILLWAY
BASE OF HILL

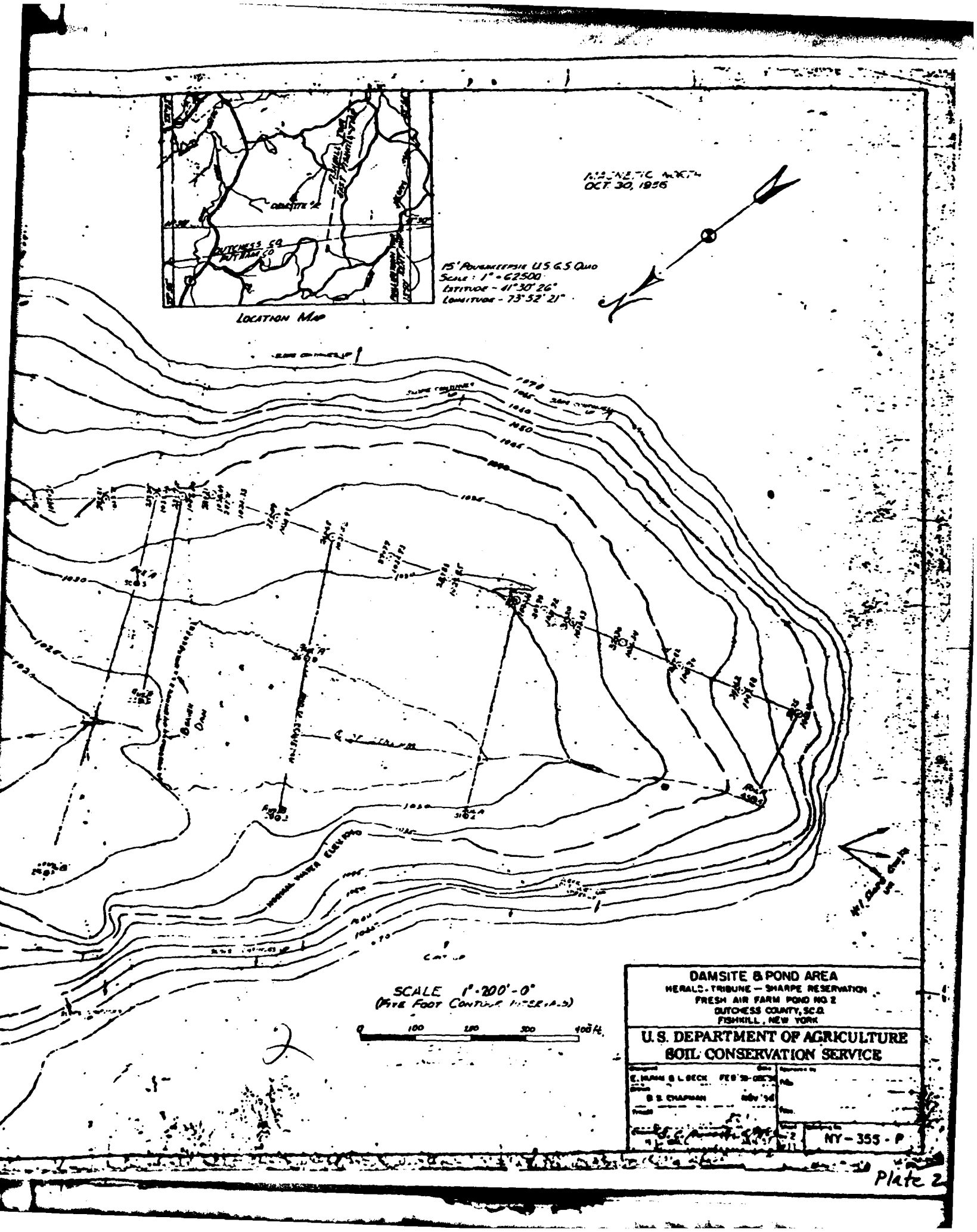

LOCATION MAP
15' POUGHKEEPSIE U.S.G.S. QUAD
SCALE: 1" = 62500
LATITUDE - 41°30'26"
LONGITUDE - 73°52'21"
MAGNETIC NORTH
OCT. 30, 1956
SCALE 1" = 200' - 0"
(FIVE FOOT CONTOUR INTERVALS)
0 100 200 300 400 FT.
DAMSITE & POND AREA
HERALD-TRIBUNE — SHARPE RESERVATION
FRESH AIR FARM POND NO. 2
DUTCHESS COUNTY, S.C.D.
FISHKILL, NEW YORK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NY-355-P

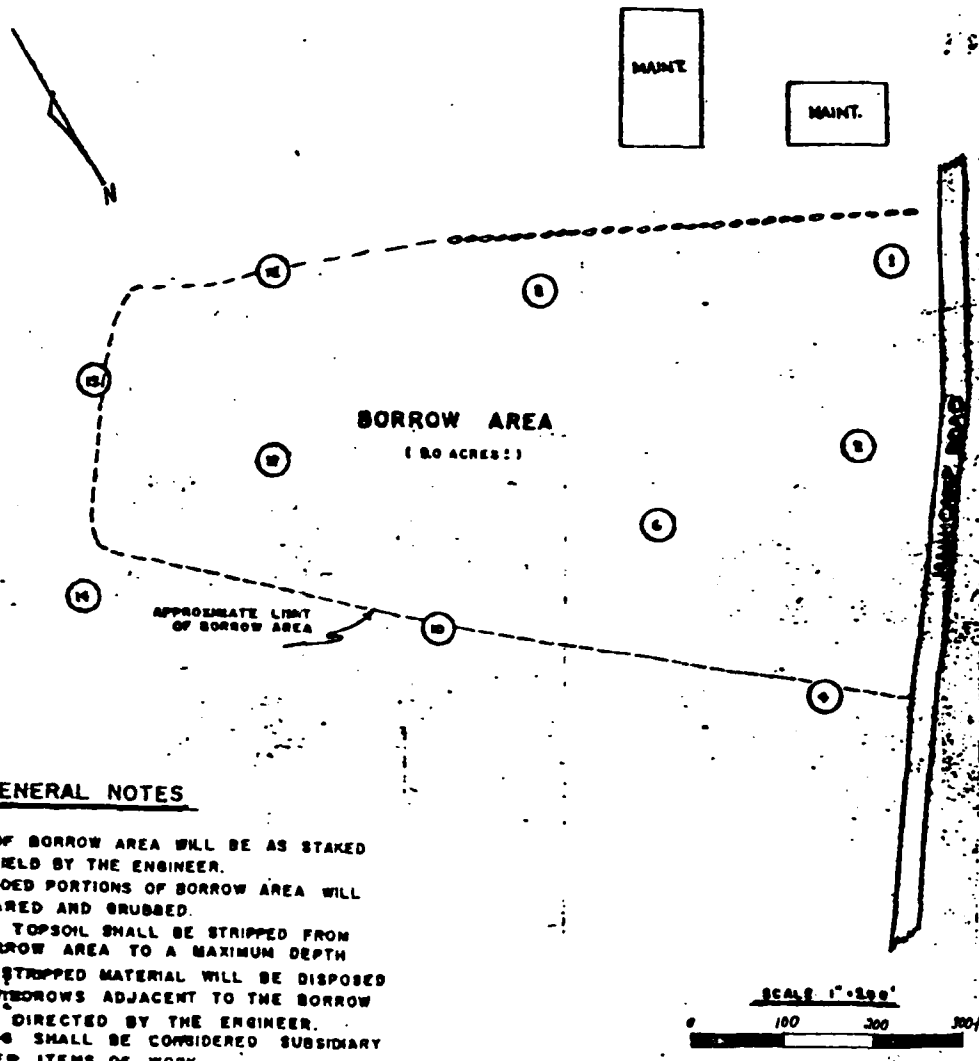
Plate 2

TP 13 ELEV. 125.1

0 1 Topsoil
1 11 Sand with gravel (or sand) (SC or GC) some silt and clay - lt. brown - fairly dense - sud. perm. - moist.
11 15 Sands with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) - several 3' to 4' boulders - no seepage in hole. (SC)

TP 14 ELEV. 99.6

0 1 Topsoil
1 11 Sand with gravel - some silt and clay - lt. brown - fairly dense - sud. perm. - moist (SC or GC)
11 16 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) - fairly strong seepage at 16'. (SC)



GENERAL NOTES

1. LIMITS OF BORROW AREA WILL BE AS STAKED IN THE FIELD BY THE ENGINEER.
2. ALL WOODED PORTIONS OF BORROW AREA WILL BE CLEARED AND GRUBBED.
3. SOD AND TOPSOIL SHALL BE STRIPPED FROM THE BORROW AREA TO A MAXIMUM DEPTH OF 1.0'. STRIPPED MATERIAL WILL BE DISPOSED OF IN WINDROWS ADJACENT TO THE BORROW AREA AS DIRECTED BY THE ENGINEER. STRIPPING SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS OF WORK.
4. BORROW SHALL BE REMOVED IN SUCH A MANNER SO THAT AT THE COMPLETION OF EARTH FILL OPERATIONS, THE BORROW AREA WILL BE LEFT GENTLY SLOPING, GENERALLY SMOOTH, FREE DRAINING, AND WITH BACK SLOPES NO STEEPER THAN $2\frac{1}{2}$:1.

TP 1 ELEV. 102.0

0 1 Topsoil
1 3 Sand - 10 to 15% silt and clay - lt. brown - fairly dense - sud. perm. - moist
3 9 Sand with gravel - clay - lt. brown - sud. perm. - moist
9 10 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till)
10 15 Sand with some gravel - good gradation down to silts and clays - blue gray - very dense - perm. - moist (glacial till) - slight seepage in hole.

TP 2 ELEV. 94.0

0 1 Topsoil
1 4 Sand - 10 to 15% silt and clay - lt. brown - fairly dense - sud. perm. - moist
4 10 Sand with some gravel - gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till)
10 15 Sand with some gravel - gradation down to silts and clays - blue gray - very dense - perm. - moist (glacial till) - slight seepage in hole.

TP 4 ELEV. 70.0

0 1 Topsoil
1 13 Sand with some gravel - gradation down to silts and clays - brown - very dense - perm. - moist (glacial till)
13 15 Sand with some gravel - gradation down to silts and clays - blue gray - very dense - perm. - moist (glacial till)

TP 6 ELEV. 95.1

0 1 Topsoil
1 13 Sand with some gravel - gradation down to silts and clays - brown - very dense - perm. - moist (glacial till)
13 15 Sand with some gravel - gradation down to silts and clays - blue gray - very dense - perm. - moist (glacial till) - seepage in hole.

TP 8 ELEV. 116.0

0 1 Topsoil
1 13 Sand with some gravel - gradation down to silts and clays - brown - very dense - perm. - moist (glacial till) - slight amount of clayey gravel - seepage in hole - slides of considerably.

TP 10 ELEV. 85.3

0 1 Topsoil
1 13 Sand with some gravel - gradation down to silts and clays - brown - very dense - perm. - moist (glacial till)
13 15 Sand with some gravel - gradation down to silts and clays - blue gray - very dense - perm. - moist (glacial till)

TP 11 ELEV. 97.2

0 1 Topsoil
1 11 Sand with some gravel - gradation down to silts and clays - brown - very dense - perm. - moist (glacial till)
11 17 Sand with some gravel - gradation down to silts and clays - blue gray - very dense - perm. - moist (glacial till) - heavy seepage at 17' - hill side slides.

TP 12 ELEV. 108.3

0 1 Topsoil
1 6 Sand with some gravel and clay - lt. brown - fairly dense - sud. perm. - moist
6 13 Sand with some gravel - gradation down to silts and clays - brown - very dense - perm. - moist (glacial till) - 6" cobbles at 6' - 8" cobbles at 8' - volume of [illegible]

GEOLOGIC INVESTIGATION
SOIL DESCRIPTIONS [illegible]
VISUAL EXAMINATION.

ELEV. 100.0

1 Topsoil
3 Sand - 10 to 135 + 4's - some silt and clay - lt. brown - fairly loose - sat. permeable - moist (SC)
9 Sand with gravel - some silt and clay - lt. brown - fairly dense - sat. perm. - moist (SC or OC)
20 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) (SC)
25 Sand with some gravel - good gradation down to silts and clays - blue gray - very dense - slight perm. - moist (glacial till) - minor seepage in hole (SC)

ELEV. 89.0

1 Topsoil
4 Sand - 10 to 135 + 4's - some silt and clay - lt. brown - fairly loose - sat. perm. - moist (SC)
20 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) (SC)
25 Sand with some gravel - good gradation down to silts and clays - blue gray - very dense - slight perm. - moist (glacial till) - minor seepage in hole. (SC)

ELEV. 76.8

1 Topsoil
15 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) (SC)
25 Sand with some gravel - good gradation down to silts and clays - blue gray - very dense - slight perm. - moist (glacial till) (SC)

TP 6 ELEV. 97.1

1 Topsoil
15 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) (SC)
25 Sand with some gravel - good gradation down to silts and clays - blue gray - very dense - slight perm. - moist (glacial till) minor seepage in hole. (SC)

TP 8 ELEV. 116.0

1 Topsoil
15 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) several lenses of cleaner gravel - heavy seepage in hole - sides of hole caved considerably. (SC)

TP 10 ELEV. 89.3

1 Topsoil
15 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) (SC)
25 Sand with some gravel - good gradation down to silts and clays - blue gray - very dense - slight perm. - moist (glacial till) (SC)

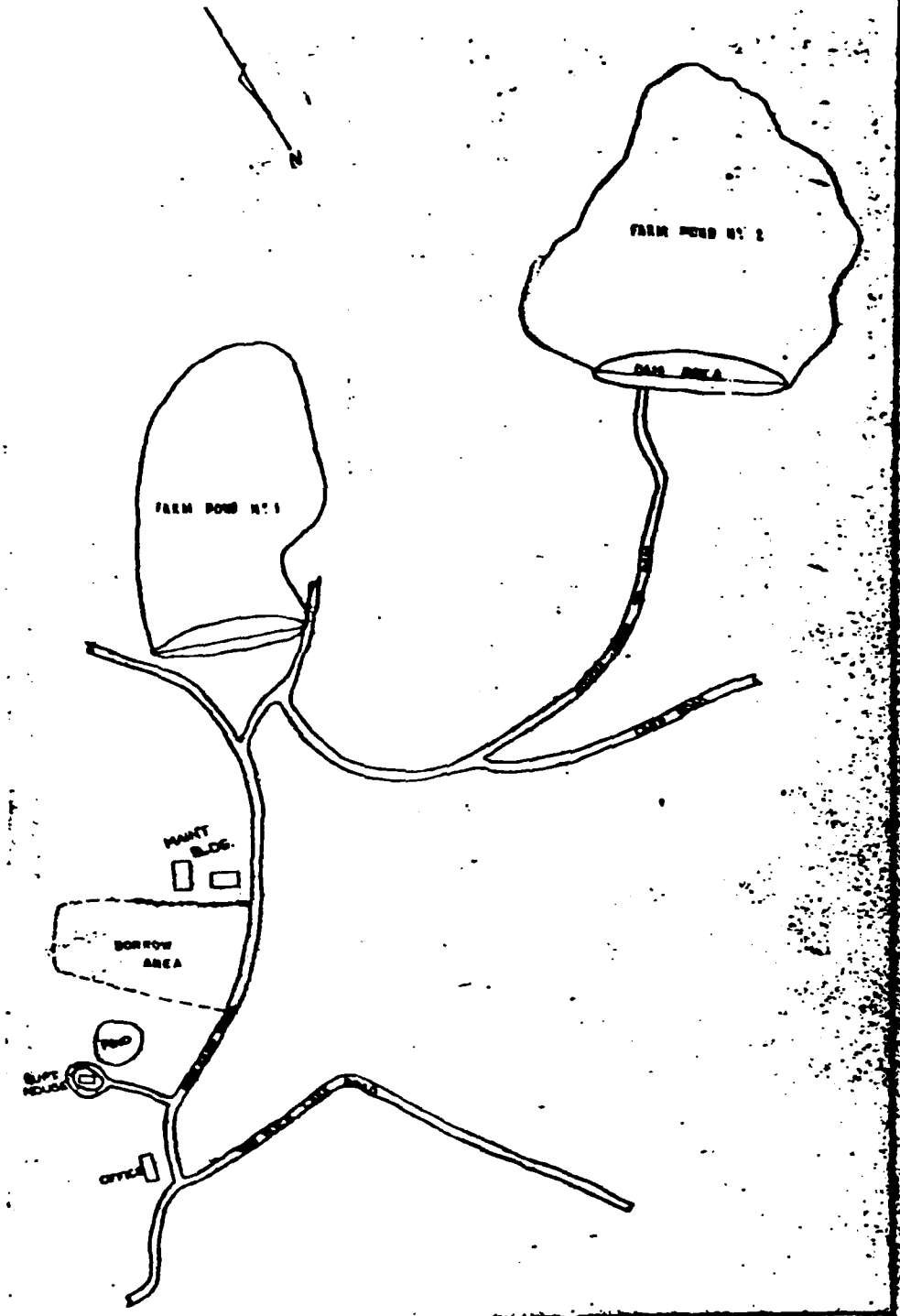
TP 11 ELEV. 97.2

1 Topsoil
11 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) (SC)
17 Sand with some gravel - good gradation down to silts and clays - blue gray - very dense - slight perm. - moist (glacial till) fairly heavy seepage at 6' depth from uphill side of hole. (SC)

TP 12 ELEV. 118.3

1 Topsoil
6 Sand with gravel - some silt and clay - lt. brown - fairly dense - sat. perm. - moist (SC or OC)
15 Sand with some gravel - good gradation down to silts and clays - brown - very dense - slight perm. - moist (glacial till) - some seepage in hole - several 3' to 5' boulders in the pit - many 4" cobbles - approx. 10% by volume of 4" material. (SC or CL)

GEOLOGIC INVESTIGATION DATE APRIL 63
SOIL DESCRIPTIONS DETERMINED BY VISUAL EXAMINATION.



SCALE : 1" = 800' (APPROX)

MAP OF

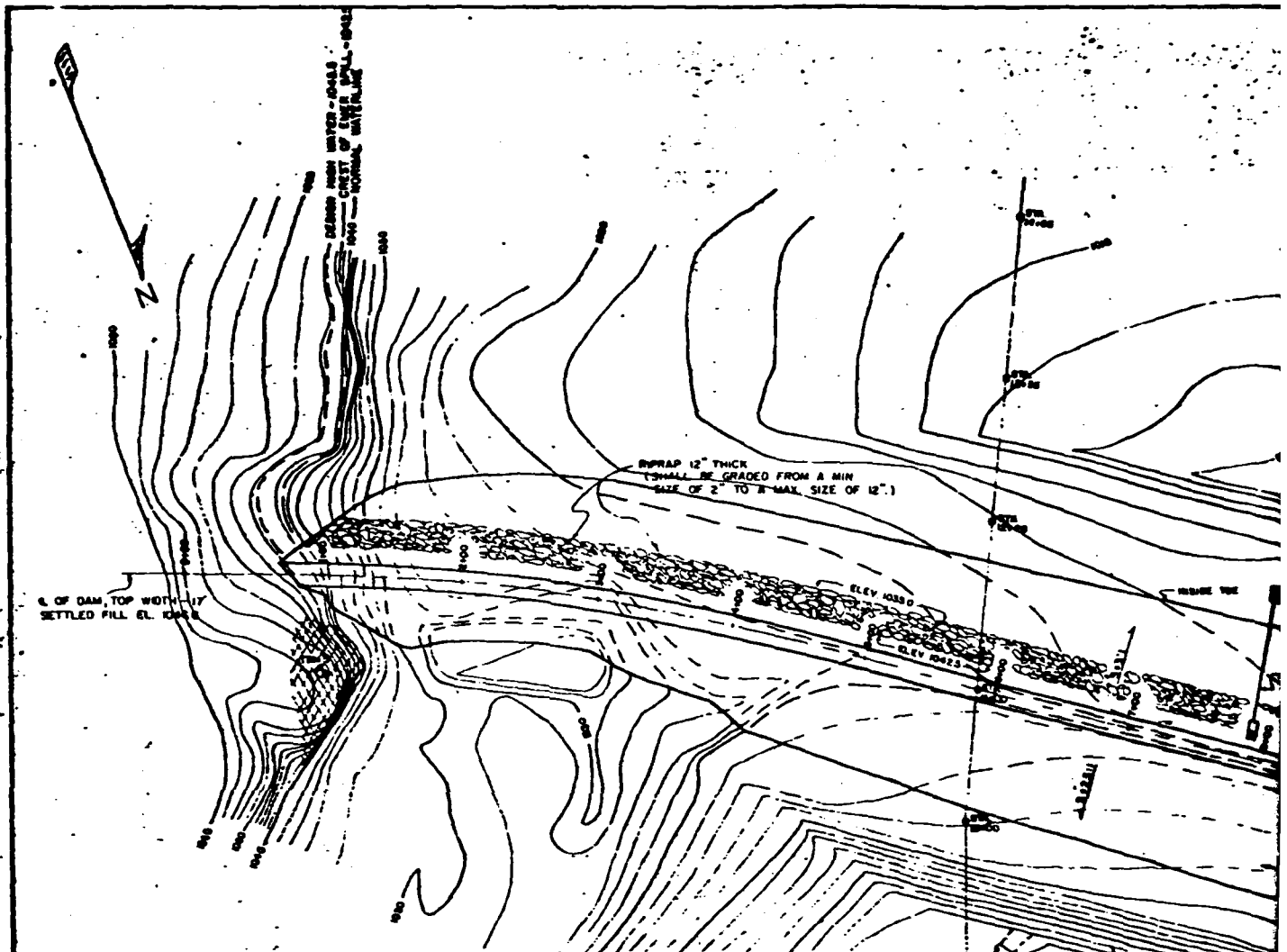
DAM AND BORROW AREA

BORROW AREA B & TEST PIT DESCRIPTIONS
HERALD TRIBUNE - SHARPE RESERVATION
FRESH AIR FARM POND NO. 2
DUTCHESS COUNTY S.C.D.
FISHKILL, NEW YORK

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY - 355 - P.

Plate 3



GENERAL NOTES

1. Area upstream from dam and below elev. 1035.0 shall be grubbed. Disposal area for stumps and debris shall be designated in the field by the engineer.

2. Soil overburden on bedrock on west abutment shall be removed and will not be paid for, but shall be considered subsidiary to other items of work.

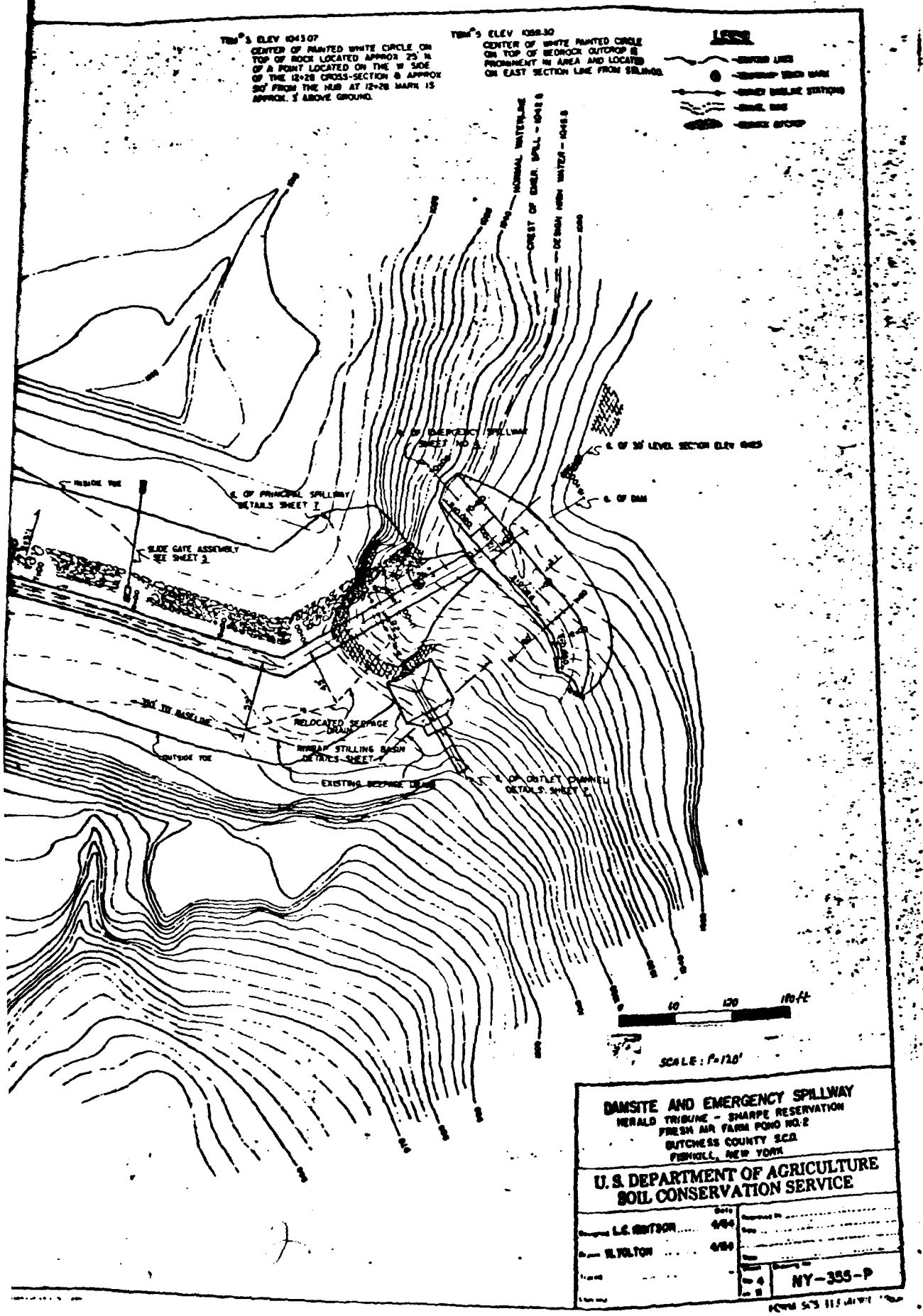
3. Common excavation involved in the construction of the principal spillway, stilling basin, principal spillway exit channel, entrance channel to the pond drain inlet and the removal of the upstream end of the drain pipe will not be paid for, but shall be considered subsidiary to other items of work.

4. Existing pipe spillway and concrete inlet located on west abutment will be removed as part of this contract. Payment will be made as "Structure Removal."

5. Slide Gate Assembly purchased by owner to be installed by Contractor.

SEEPAGE DRAIN RELOCATION

1. Starting at a point approximately 350' west of base line, remove all filter material along existing seepage drain to the stilling basin. This material may be used in the relocated seepage drain. Construct drain to the line and grade as shown on Sheet 6.
2. Remove the 6" perf. RCCP along this section and relocate to the line and grade as shown on Sheet 6.
3. Backfill section of existing seepage drain in sum (1) above with fill material and compaction of Section I, Sheet 3.
4. The relocation shall be considered a lump sum item and shall be paid for as "seepage drain relocation."



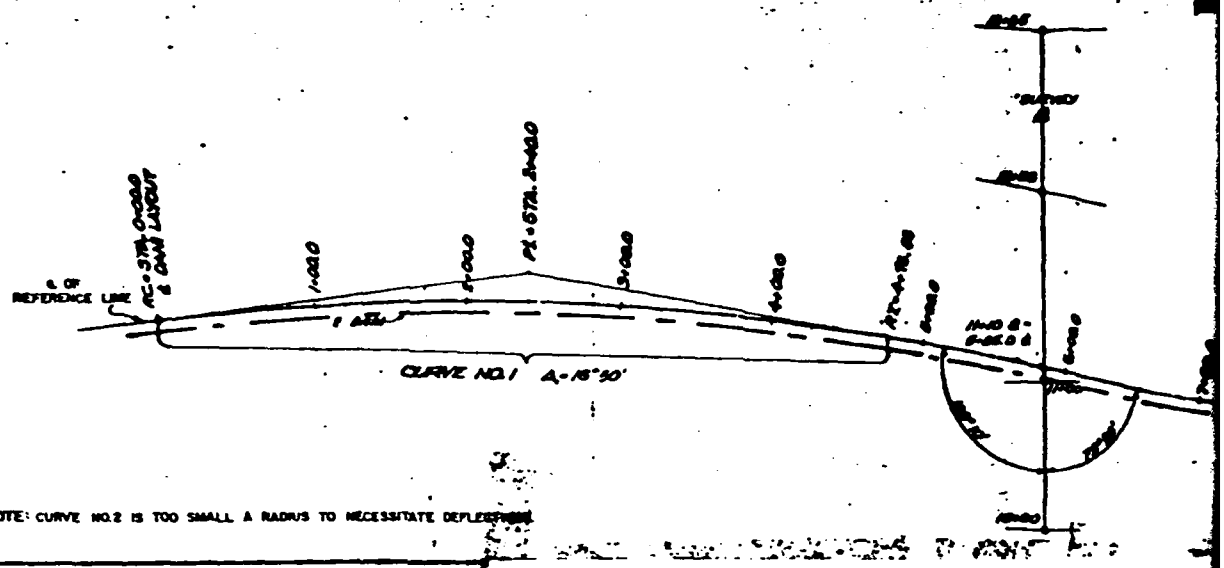
DAMSITE AND EMERGENCY SPILLWAY
HERALD TRIBUNE - SHARPE RESERVATION
FRESH AIR FARM POND NO. 2
DUTCHESS COUNTY S.C.D.
FISHKILL, NEW YORK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed L.G. GRITSON 4/84
Drawn W. TOLTON 4/84

NY-355-P

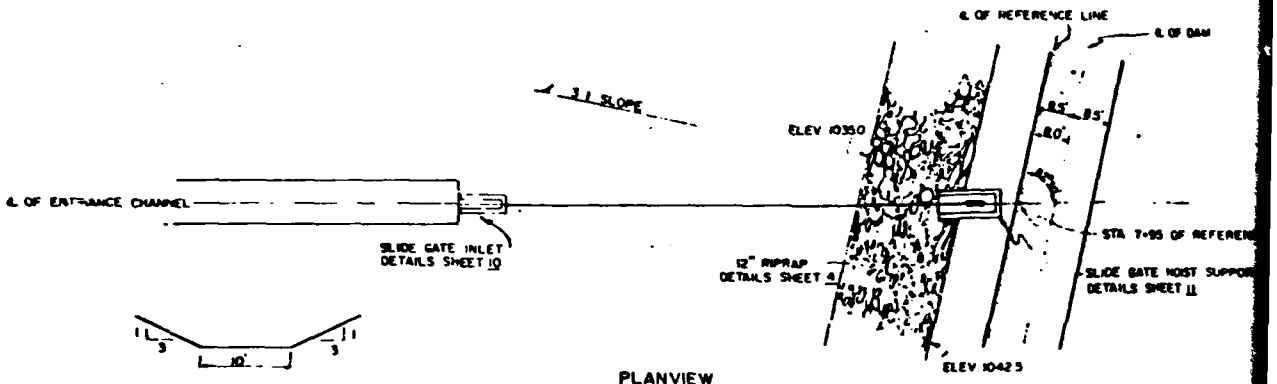
Plate 4



NOTE: CURVE NO.2 IS TOO SMALL A RADIUS TO NECESSITATE DEFLECTIONS

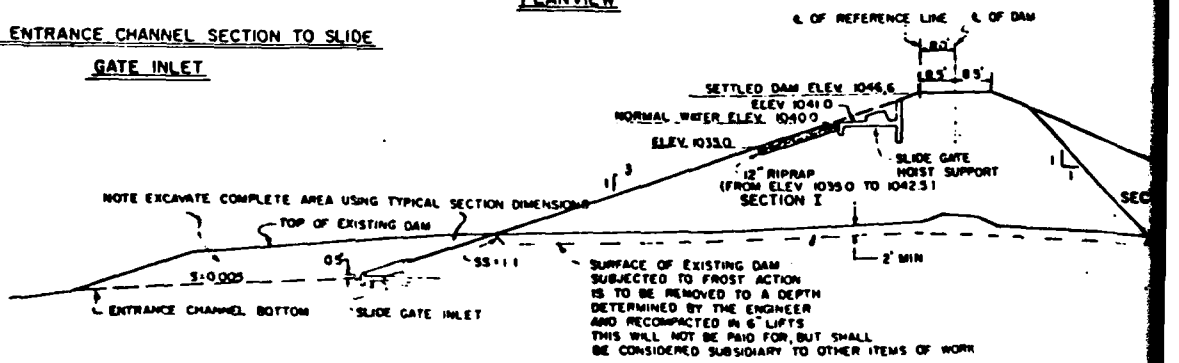
CURVE NO. 1			CURVE NO. 2
CURVE FUNCTIONS	STATION	DEFLECTION	CURVE FUNCTIONS
[illegible]	[illegible]	[illegible]	[illegible]

LAYOUT DATA

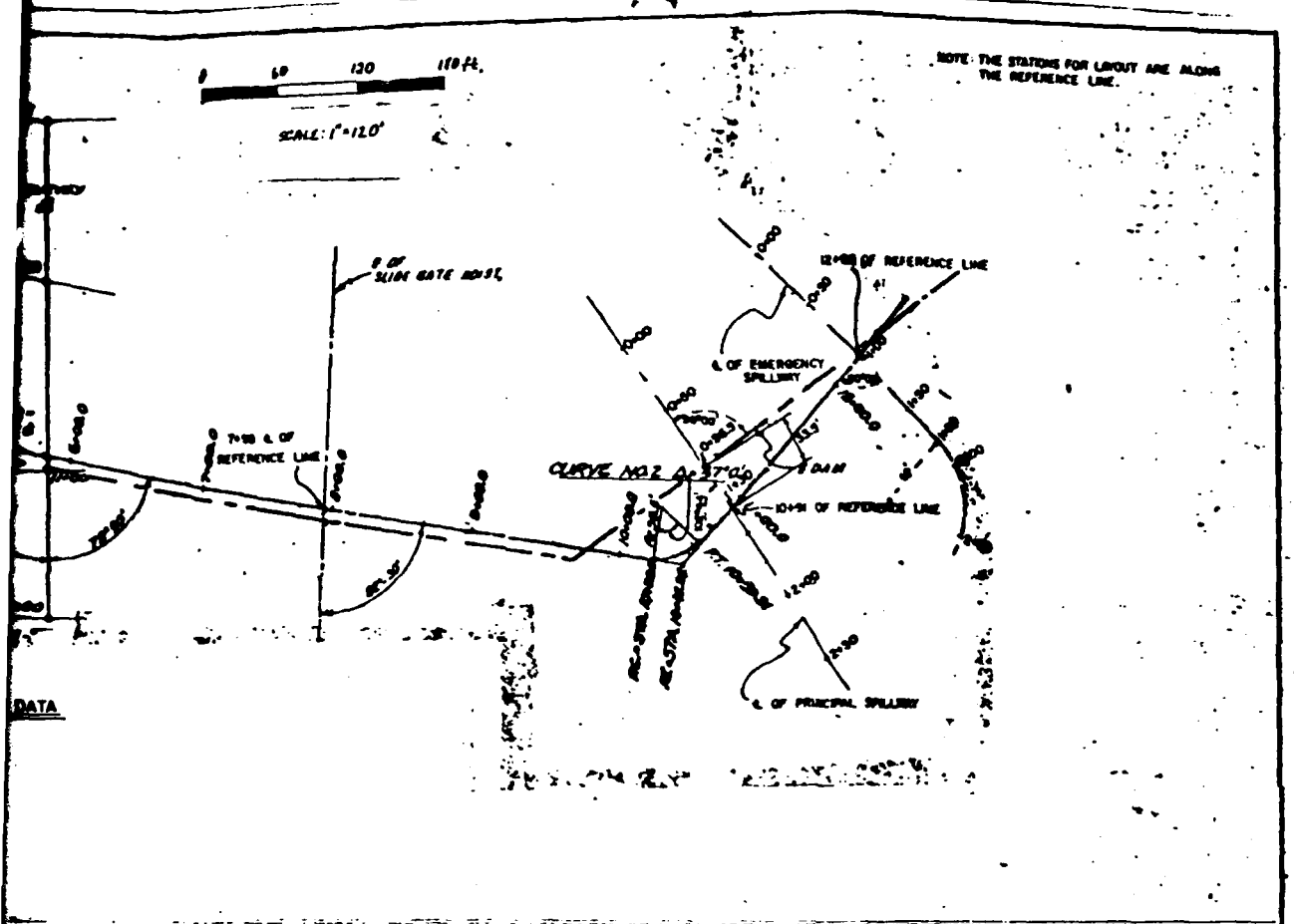


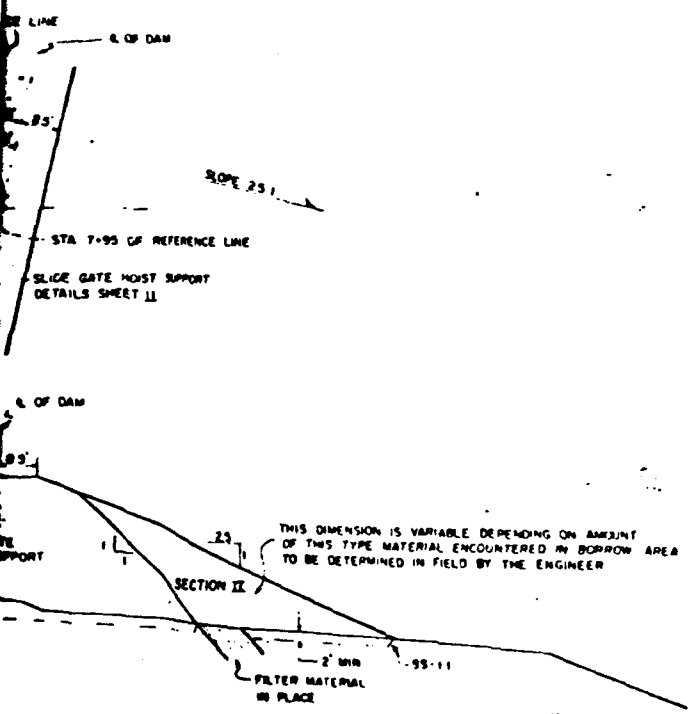
PLANVIEW

TYPICAL ENTRANCE CHANNEL SECTION TO SLIDE GATE INLET



SECTION ALONG ℄ OF POND DRAIN





SECTION I

COMPACTED EARTH FILL CLASS B-2, "BROWN TILL" SAND AND CLAY WITH GRAVELS (SC OR CL) REPRESENTED BY TEST PIT NO. 12 FROM 6 TO 13FT AND "BLUE TILL" CLAYEY SAND WITH GRAVELS (SC) REPRESENTED BY TEST PIT NO. 11 FROM 11 TO 17FT.

SECTION II

COMPACTED EARTH FILL CLASS B-2, "SANDY TILL" CLAYEY SAND WITH GRAVELS (SC) REPRESENTED BY THE LOG OF TEST PIT NO. 12 FROM 1 TO 6FT.

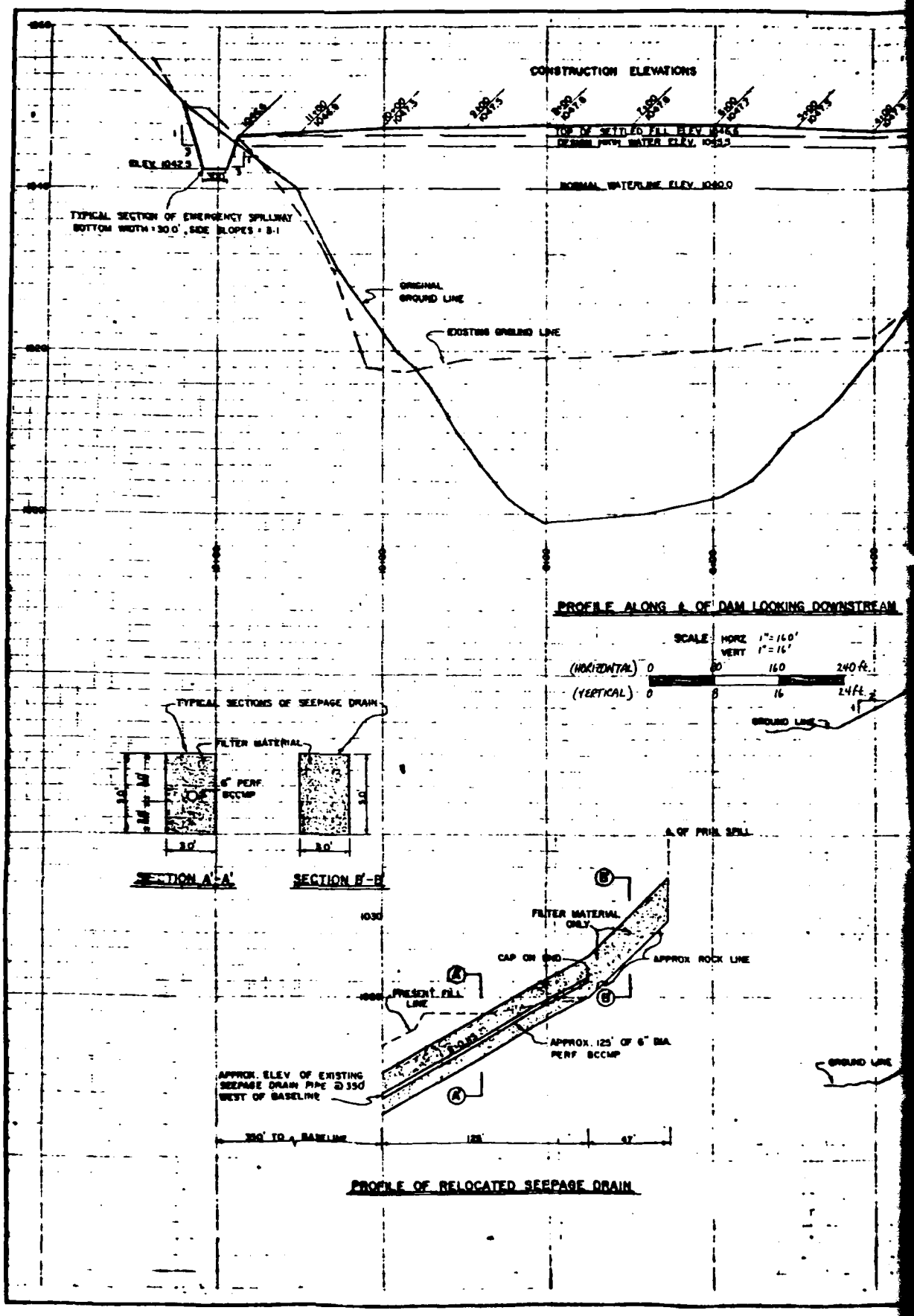
LAYOUT DATA AND POND DRAIN DETAILS
HERALD TRIBUNE - SHARPE RESERVATION
FRESH AIR FARM POND NO. 2
DUTCHESS COUNTY S.C.D.
FISHKILL, NEW YORK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

L.C. ROBITSON 4/64
W. YOLTON 4/64

NY-355-P

Plate 5


CONSTRUCTION ELEVATIONS
TOP OF SETTLED FILL ELEV. 1048.6
DESIGN HIGH WATER ELEV. 1043.5
NORMAL WATERLINE ELEV. 1040.0
ELEV. 1042.5
TYPICAL SECTION OF EMERGENCY SPILLWAY
BOTTOM WIDTH = 30.0', SIDE SLOPES = 3:1
ORIGINAL GROUND LINE
EXISTING GROUND LINE
PROFILE ALONG ℄ OF DAM LOOKING DOWNSTREAM
SCALE HORZ 1" = 160'
VERT 1" = 16'
(HORIZONTAL) 0 80 160 240 ft.
(VERTICAL) 0 8 16 24 ft.
GROUND LINE
TYPICAL SECTIONS OF SEEPAGE DRAIN
FILTER MATERIAL
6" PERF. BCCMP
3.0'
SECTION A'-A'
SECTION B'-B'
℄ OF PRIM. SPILL
1030
FILTER MATERIAL ONLY
CAP ON END
APPROX. ROCK LINE
PRESENT FILL LINE
APPROX. 125' OF 6" DIA. PERF. BCCMP
APPROX. ELEV. OF EXISTING SEEPAGE DRAIN PIPE @ 350' WEST OF BASELINE
350' TO ℄ BASELINE
125'
47'
GROUND LINE
PROFILE OF RELOCATED SEEPAGE DRAIN

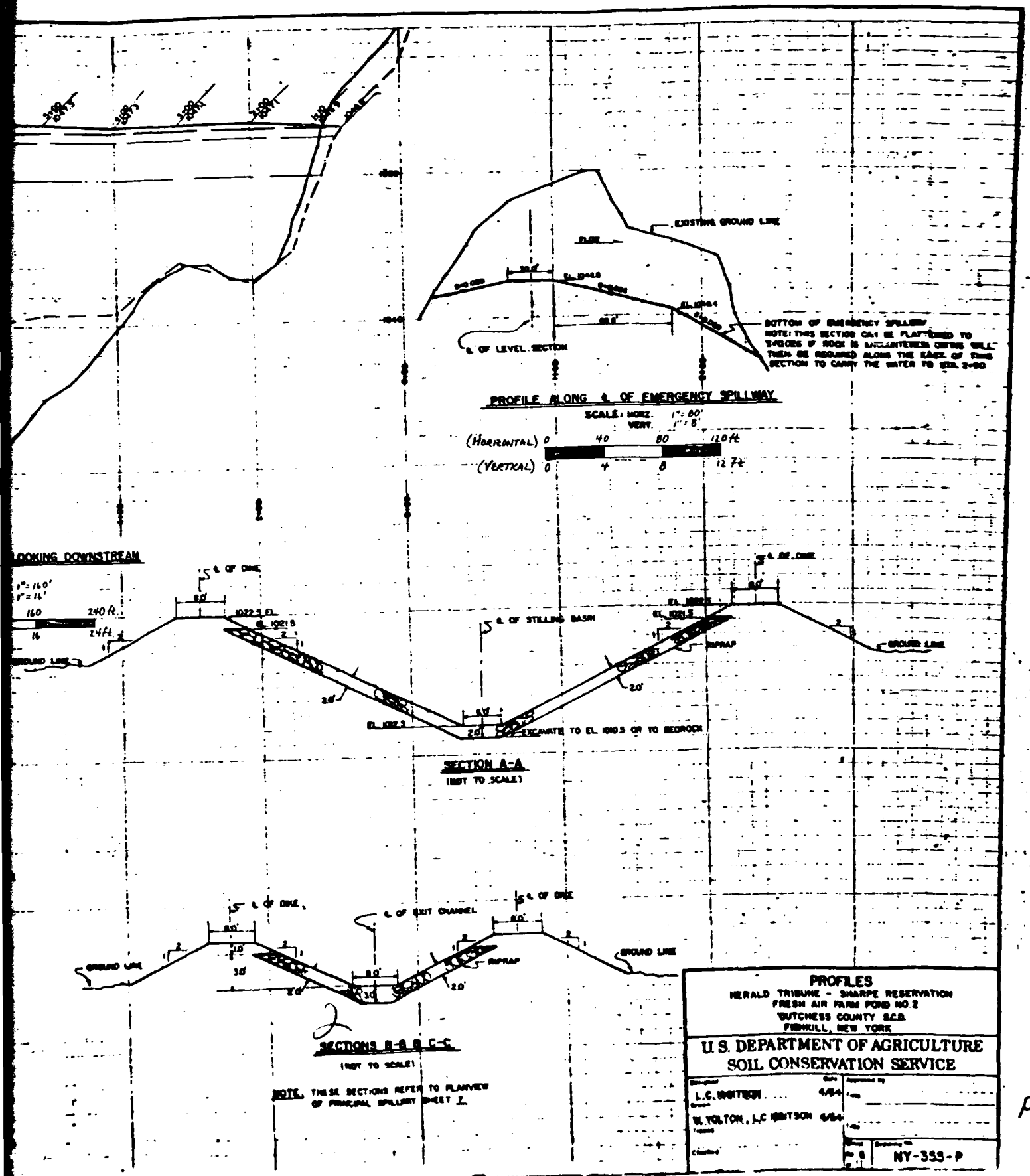
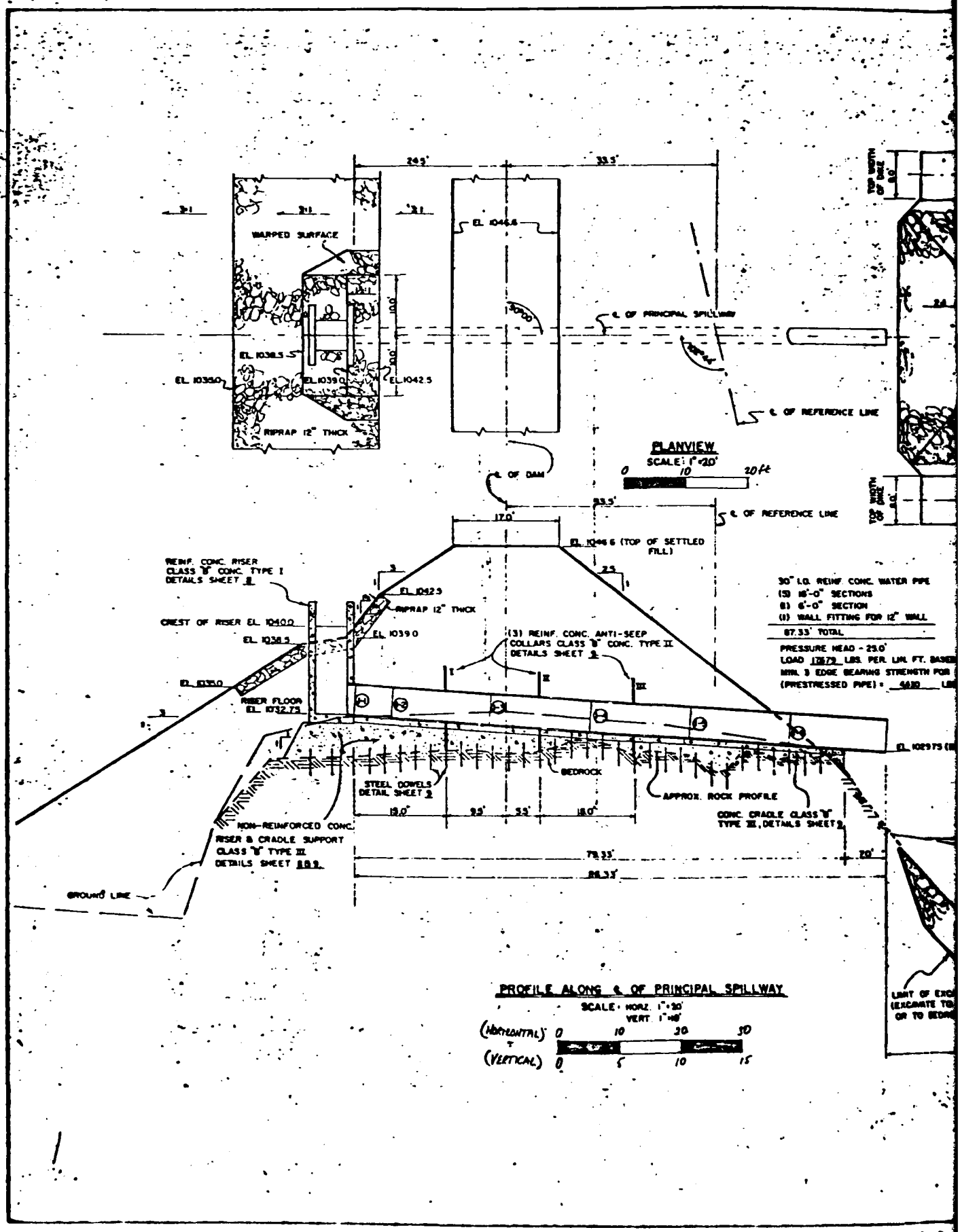
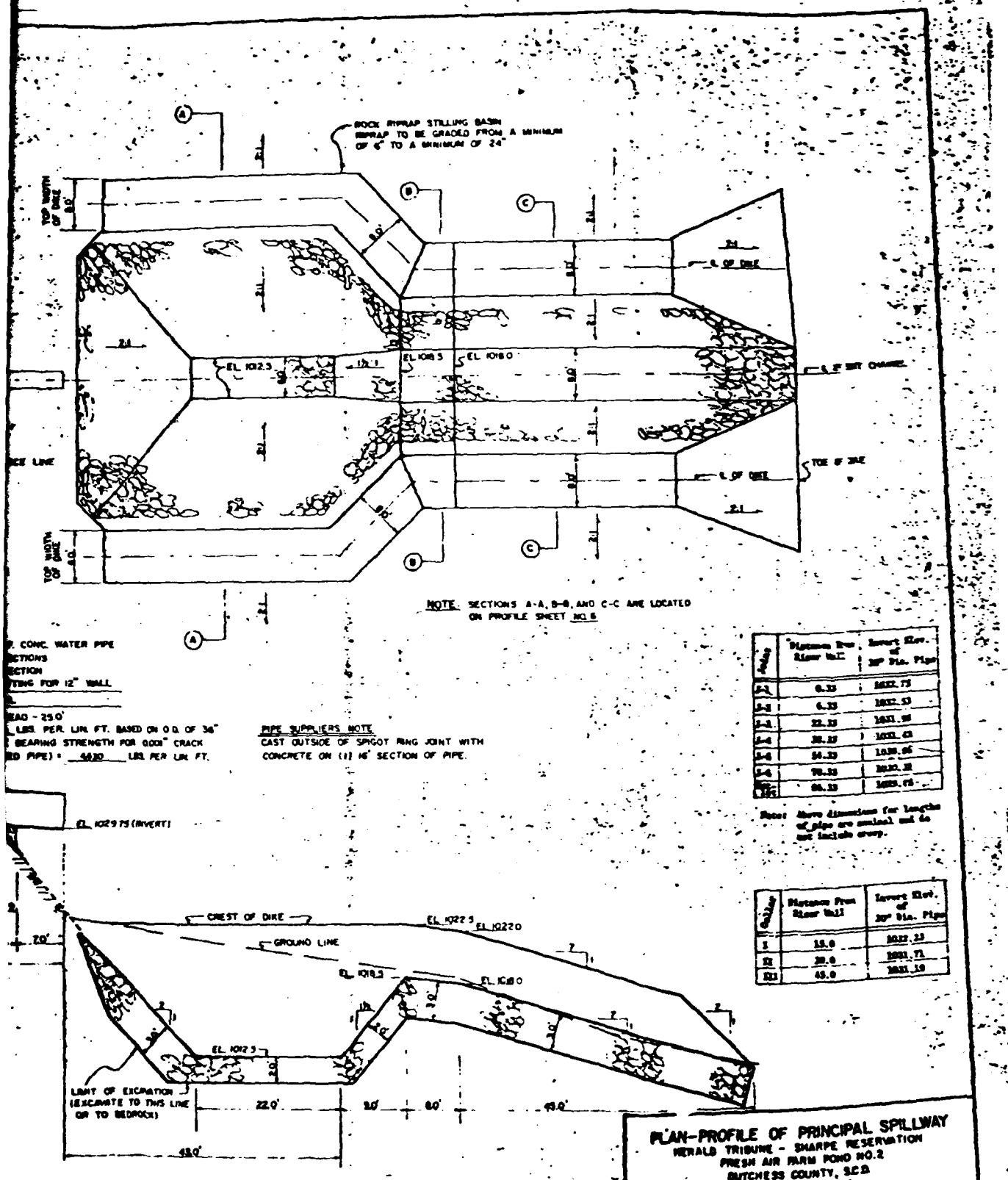

EXISTING GROUND LINE
FLOW
℄ OF LEVEL SECTION
BOTTOM OF EMERGENCY SPILLWAY
PROFILE ALONG ℄ OF EMERGENCY SPILLWAY
SCALE: HORIZ. 1" = 80'
VERT. 1" = 8'
(HORIZONTAL) 0 40 80 120 ft
(VERTICAL) 0 4 8 12 ft
LOOKING DOWNSTREAM
1" = 16'
1" = 16'
160 240 ft
16 24 ft
℄ OF DIKE
GROUND LINE
EL. 1021.5
℄ OF STILLING BASIN
RIPRAP
EXCAVATE TO EL. 1010.5 OR TO BEDROCK
SECTION A-A
(NOT TO SCALE)
℄ OF EXIT CHANNEL
SECTIONS B-B & C-C
(NOT TO SCALE)
NOTE: THESE SECTIONS REFER TO PLANVIEW OF PRINCIPAL SPILLWAY SHEET 1.
PROFILES
HERALD TRIBUNE - SHARPE RESERVATION
FRESH AIR FARM POND NO. 2
DUTCHESS COUNTY S.C.D.
FISHKILL, NEW YORK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
L.C. WHITSON 4/84
W. YOLTON, L.C. WHITSON 4/84
NY-355-P

Plate 6


PLANVIEW
SCALE: 1" = 20'
0 10 20 ft
WARPED SURFACE
EL. 1046.6
℄ OF PRINCIPAL SPILLWAY
℄ OF REFERENCE LINE
EL. 1038.5
EL. 1035.0
EL. 1039.0
EL. 1042.5
RIPRAP 12" THICK
℄ OF DAM
TOP WIDTH OF DIKE 8.0'
24.5'
33.5'
17.0'
EL. 1046.6 (TOP OF SETTLED FILL)
REINF. CONC. RISER CLASS "B" CONC. TYPE I DETAILS SHEET 8
CREST OF RISER EL. 1040.0
EL. 1042.5
RIPRAP 12" THICK
EL. 1039.0
EL. 1038.5
EL. 1035.0
RISER FLOOR EL. 1032.75
(3) REINF. CONC. ANTI-SEEP COLLARS CLASS "B" CONC. TYPE II DETAILS SHEET 9
30" I.D. REINF. CONC. WATER PIPE
(5) 16'-0" SECTIONS
(1) 6'-0" SECTION
(1) WALL FITTING FOR 12" WALL
87.33' TOTAL
PRESSURE HEAD - 25.0'
LOAD 12879 LBS. PER LIN. FT. BASED
MIN. 3 EDGE BEARING STRENGTH FOR
(PRESTRESSED PIPE) = 4630 LB
EL. 1029.75
BEDROCK
STEEL DOWELS DETAIL SHEET 9
APPROX. ROCK PROFILE
CONC. CRADLE CLASS "B" TYPE III, DETAILS SHEET 9
19.0' 9.5' 5.5' 18.0'
NON-REINFORCED CONC. RISER & CRADLE SUPPORT CLASS "B" TYPE III DETAILS SHEET 8 & 9
79.33'
86.33'
20'
GROUND LINE
LIMIT OF EXC
(EXCAVATE TO
OR TO BEDR
PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY
SCALE: HORZ. 1" = 20'
VERT. 1" = 10'
(HORIZONTAL) 0 10 20 30
(VERTICAL) 0 5 10 15

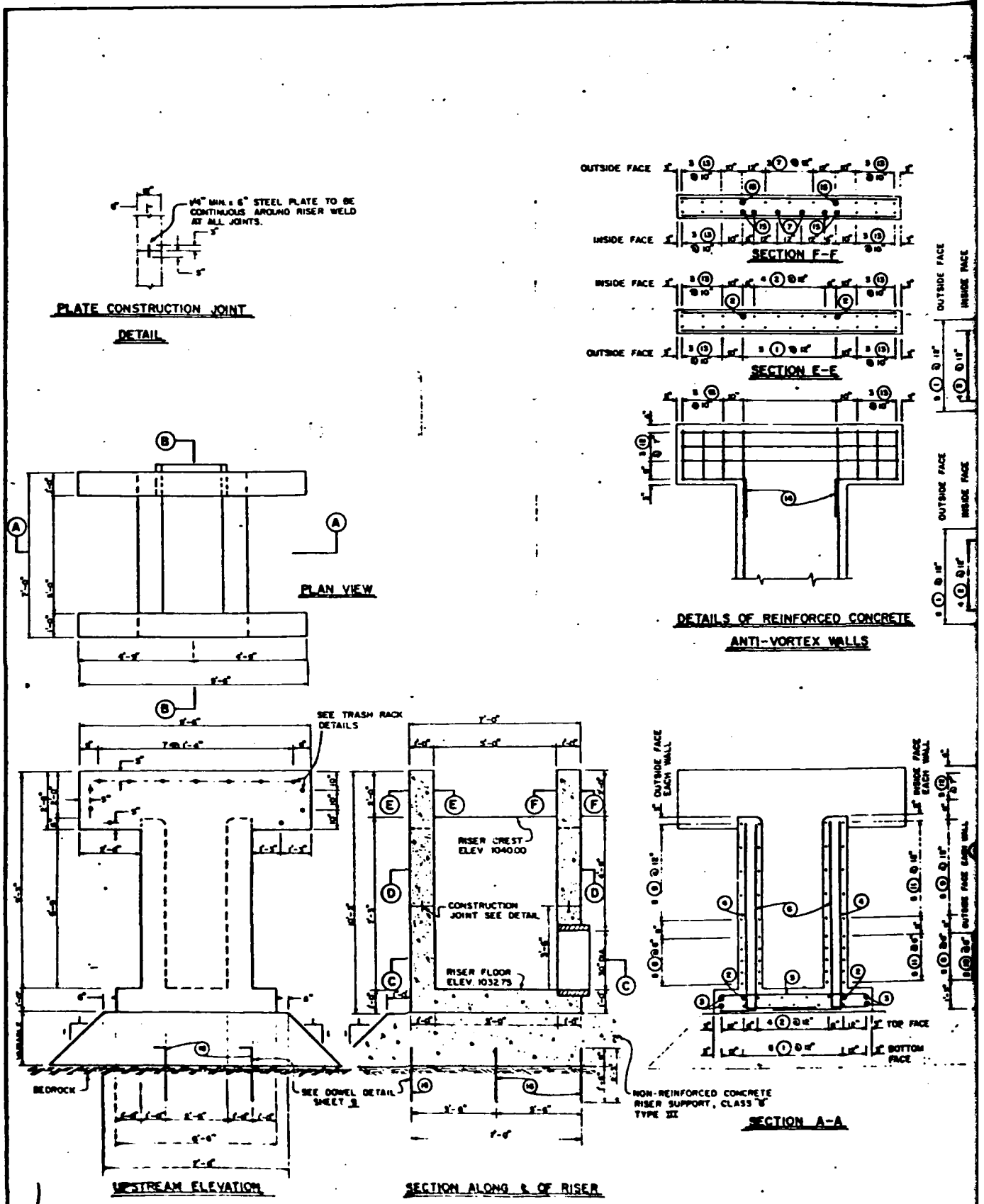


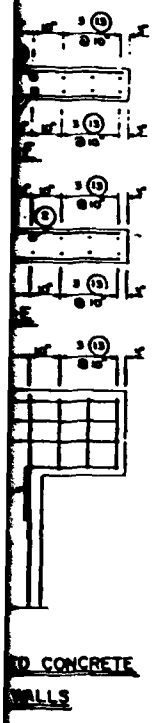
Station	Distance From River Wall	Invert Elev. of 30" Dia. Pipe
0+00	0.33	1022.75
0+50	6.33	1022.33
1+00	22.33	1021.58
1+50	38.33	1021.03
2+00	54.33	1020.65
2+50	70.33	1020.38
3+00	86.33	1020.15

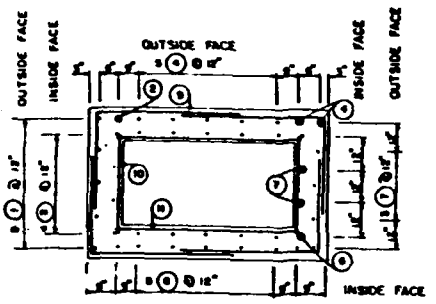
Note: Above dimensions for lengths of pipe are nominal and do not include array.

Station	Distance From River Wall	Invert Elev. of 30" Dia. Pipe
1	15.0	1022.33
2	30.0	1021.71
3	45.0	1021.10

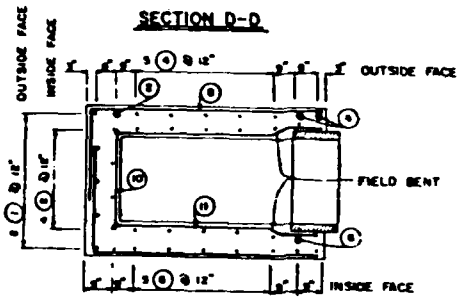
Plate 7


1/4" MIN. x 6" STEEL PLATE TO BE CONTINUOUS AROUND RISER WELD AT ALL JOINTS.
PLATE CONSTRUCTION JOINT DETAIL
OUTSIDE FACE
INSIDE FACE
SECTION F-F
SECTION E-E
DETAILS OF REINFORCED CONCRETE ANTI-VORTEX WALLS
PLAN VIEW
SEE TRASH RACK DETAILS
RISER CREST ELEV 1040.00
CONSTRUCTION JOINT SEE DETAIL
RISER FLOOR ELEV. 1032.75
BEDROCK
SEE DOWEL DETAIL SHEET 3
NON-REINFORCED CONCRETE RISER SUPPORT, CLASS "B" TYPE III
TOP FACE
BOTTOM FACE
SECTION A-A
UPSTREAM ELEVATION
SECTION ALONG ℄ OF RISER

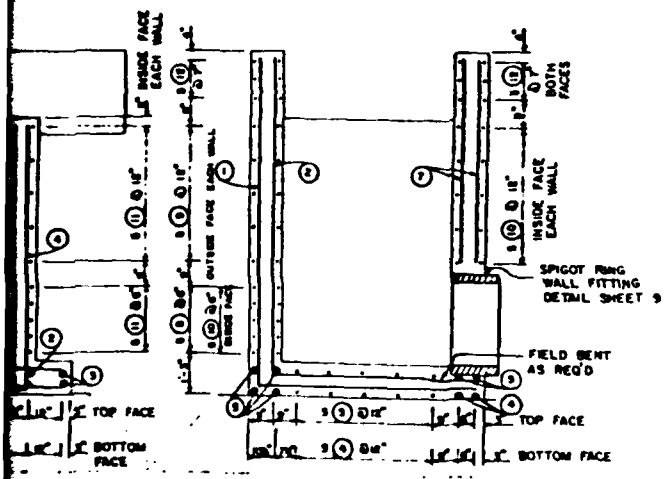




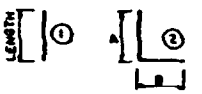
SECTION D-D



SECTION C-C



SECTION B-B



BAR TYPES

STEEL SCHEDULE

Mark	Description	Quantity	Size	Length	Type	A	B	C	Total Lbs
1	Slope	5	5	16-3	2	9-6	6-6		81.30
2	"	5	5	15-3	2	9-6	6-6		91.30
3	"	4	5	6-6	1				36.00
4	"	14	5	10-7	2	7-6	3-10		149.16
5	"	11	5	6-0	1				66.00
6	"	13	5	9-3	2	7-6	3-6		111.02
7	"	5	5	6-0	1				30.00
8	"	10	5	9-5	2	6-6	3-11		94.17
9	"	20	5	7-1	2	6-6	3-11		141.66
10	"	15	5	3-6	1				52.50
11	"	20	5	6-0	1				120.00
12	"	12	5	9-0	1				108.00
13	"	24	5	2-0	1				40.00
14	"	4	5	4-1	2	2-6	1-9		16.33
15	"	6	5	2-10	1				17.00
16	Bowls	30	8	2-9	2	2-6	2-6		164.30
17	Cradle Pedestal	3	5	6-0	2	6-0	2-0		33.75
18	"	8	5	4-4	1				34.64
19	Collars	15	4	8-11	1				13.75
20	"	24	4	6-6	1				136.00
21	"	15	4	1-4	1				19.95
22	"	12	4	12-3	1				146.04
23	"	24	4	3-4	1				84.80

STEEL SUMM.

#4 Bars 412.74 Lin.Ft. 280.4 lbs.
#5 Bars 1313.35 Lin.Ft. 1373.6 lbs.
#8 Bars 105.50 Lin.Ft. 2150 lbs.

CONCRETE SUMM. (Sheets 8 & 9)

Class B Type I 8.4
Class B Type II 3.3
Class B Type III 30.0

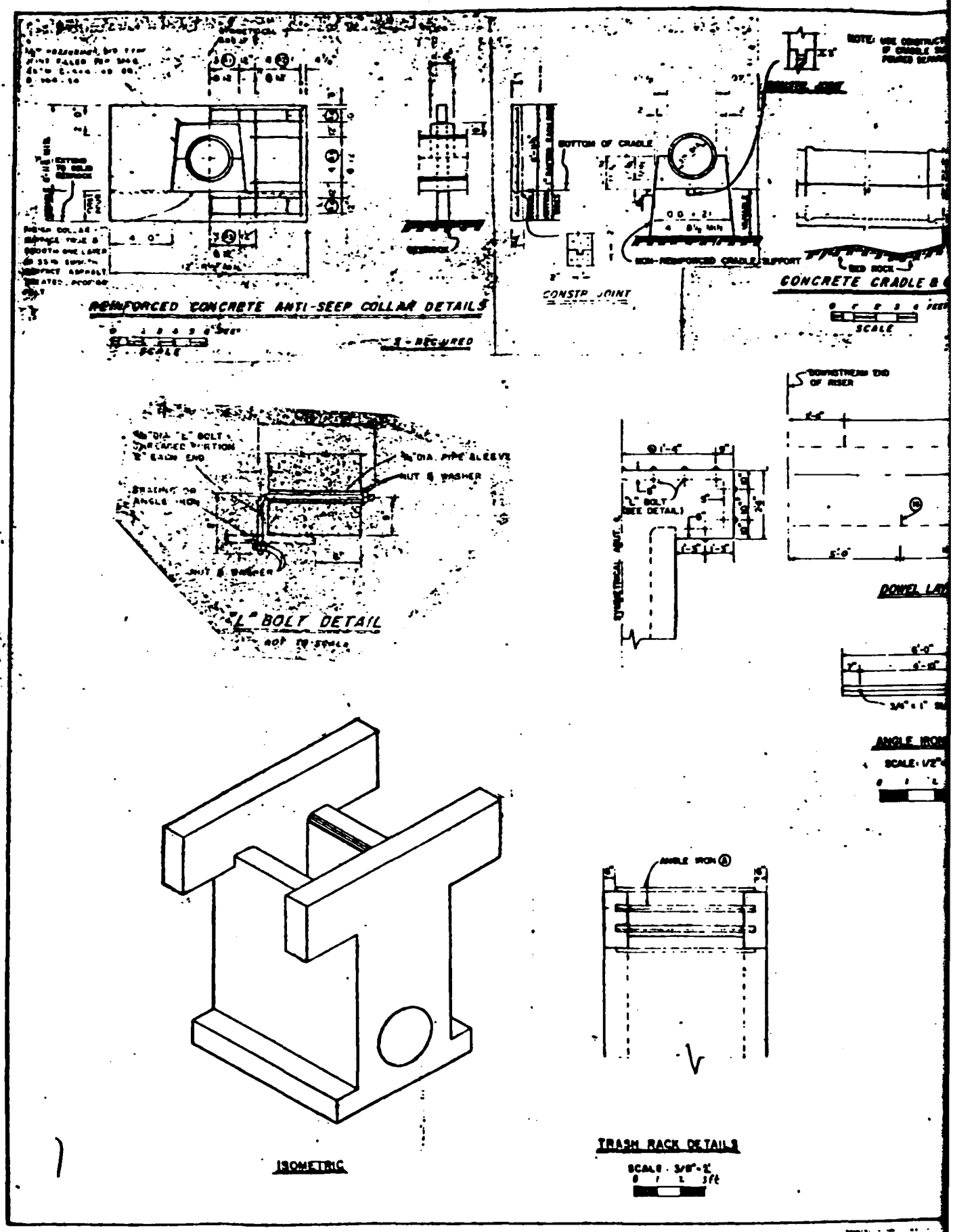
RISER DETAILS
HERALD TRIBUNE - SHARPE RESERVATION
FRESH AIR FARM POND NO 2
DUTCHESS COUNTY S.C.D.
FISHKILL, NEW YORK

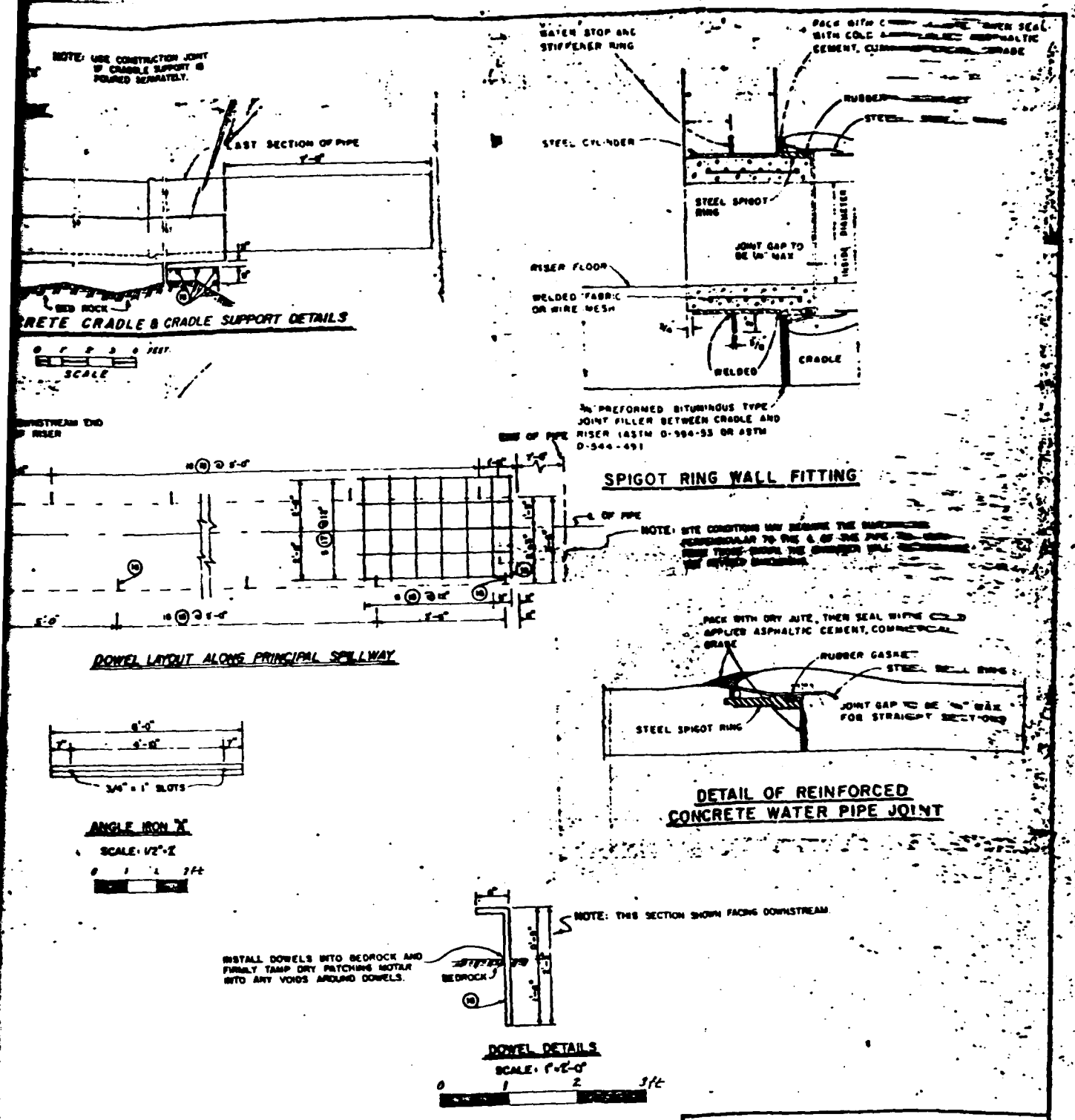
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed L.C. IBBITSON 4/64
Drawn L.C. IBBITSON 4/64
Traced
Checked
Approved by
Title
Sheet 8 of 11
Drawing No. NY-355-P

2

Plate 8


REINFORCED CONCRETE ANTI-SEEP COLLAR DETAILS
SCALE
2 - REQUIRED
BOTTOM OF CRADLE
NON-REINFORCED CRADLE SUPPORT
CONSTR JOINT
CONCRETE CRADLE &
SCALE
DOWNSTREAM END OF RISER
DOWEL LA
"L" BOLT DETAIL
NOT TO SCALE
NUT & WASHER
"L" BOLT (SEE DETAIL)
ANGLE IRON
SCALE: 1/2"
ANGLE IRON
ISOMETRIC
TRASH RACK DETAILS
SCALE: 3/8"=1'



BILL OF MATERIAL				
LOCATION	ITEM	SIZE	LGTH	QT.
TRASH RACK	[illegible] BAR W/ NUT AND WASHER	3/8 DIA	[illegible]	28
	[illegible]	3/8 DIA	1'-0	28
	[illegible] ANGLE IRON	[illegible]	8'-0	13

CRADLE, COLLAR, TRASH RACK AND MISC. DETAILS
HERALD TRIBUNE - SHARPE RESERVATION
FRESH AIR FARM POND NO. 2
DUTCHESS COUNTY, N.Y.
FISHKILL, NEW YORK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

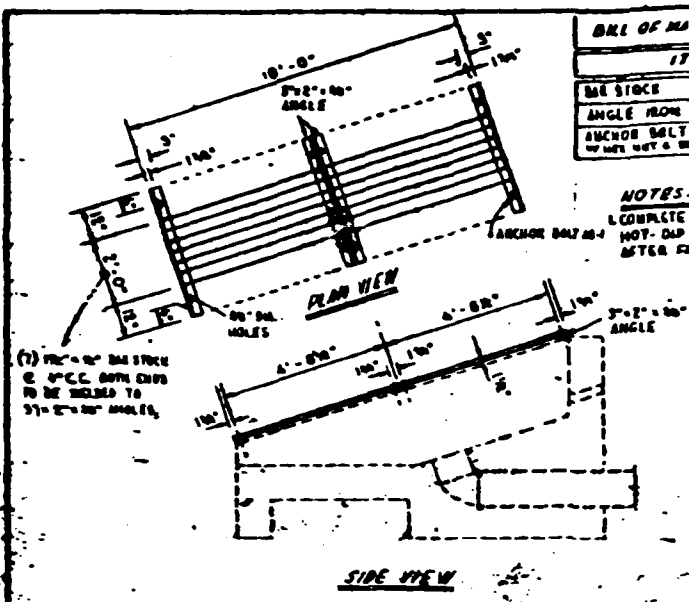
Designed L.C. IRBITSON 4/64
Drawn W. TOLTON 4/64
Traced
Checked
Approved
Date
Scale
No. 9
No. 11
WY-3A-P

2

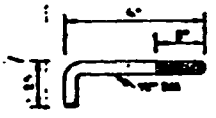
Plate 9

BILL OF MATERIAL - TRASH RACK AND SLIDE GATE			
ITEM	SIZE	LENGTH	QUAN.
BAR STOCK	[illegible]	6'-11"	16
ANGLE IRON	3"x2"x[illegible]	6'-0"	4
ANCHOR BOLT AB-1 (S.S.) W/ NUT, WASHER & BRACE	[illegible] DIA.	2" x 6"	8

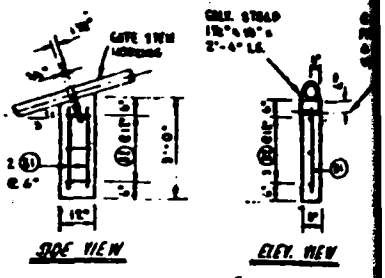
NOTES:
1. COMPLETE SCREEN TO BE HOT-DIP GALVANIZED AFTER FABRICATION
2. STEEL USED FOR ALL COMPONENTS OF TRASH RACK.



TRASH RACK FOR SLIDE GATE INLET

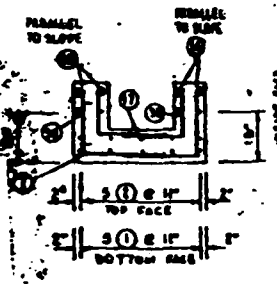


DETAIL OF STAINLESS STEEL ANCHOR BOLT AB-1

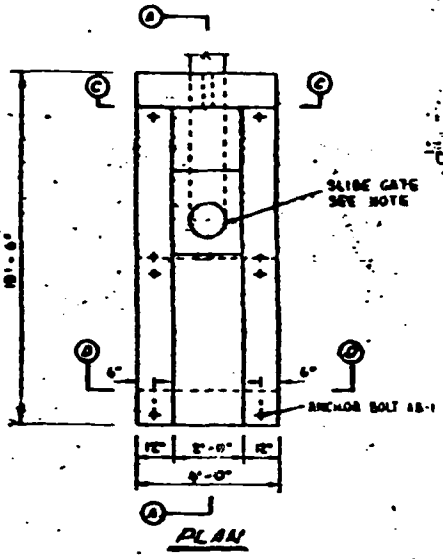


SUPPORT BLOCK FOR GATE STEM

AS REQ'D

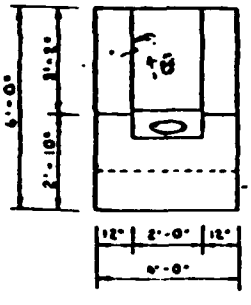


SECTION DD

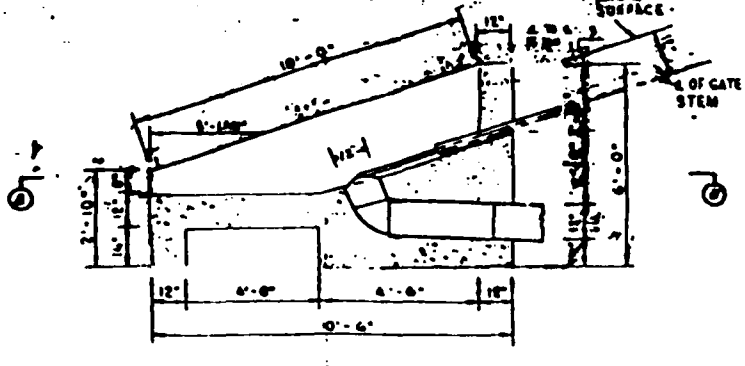


PLAN

SLIDE GATE



UPSTREAM ELEV.



SECTION ALONG CENTERLINE

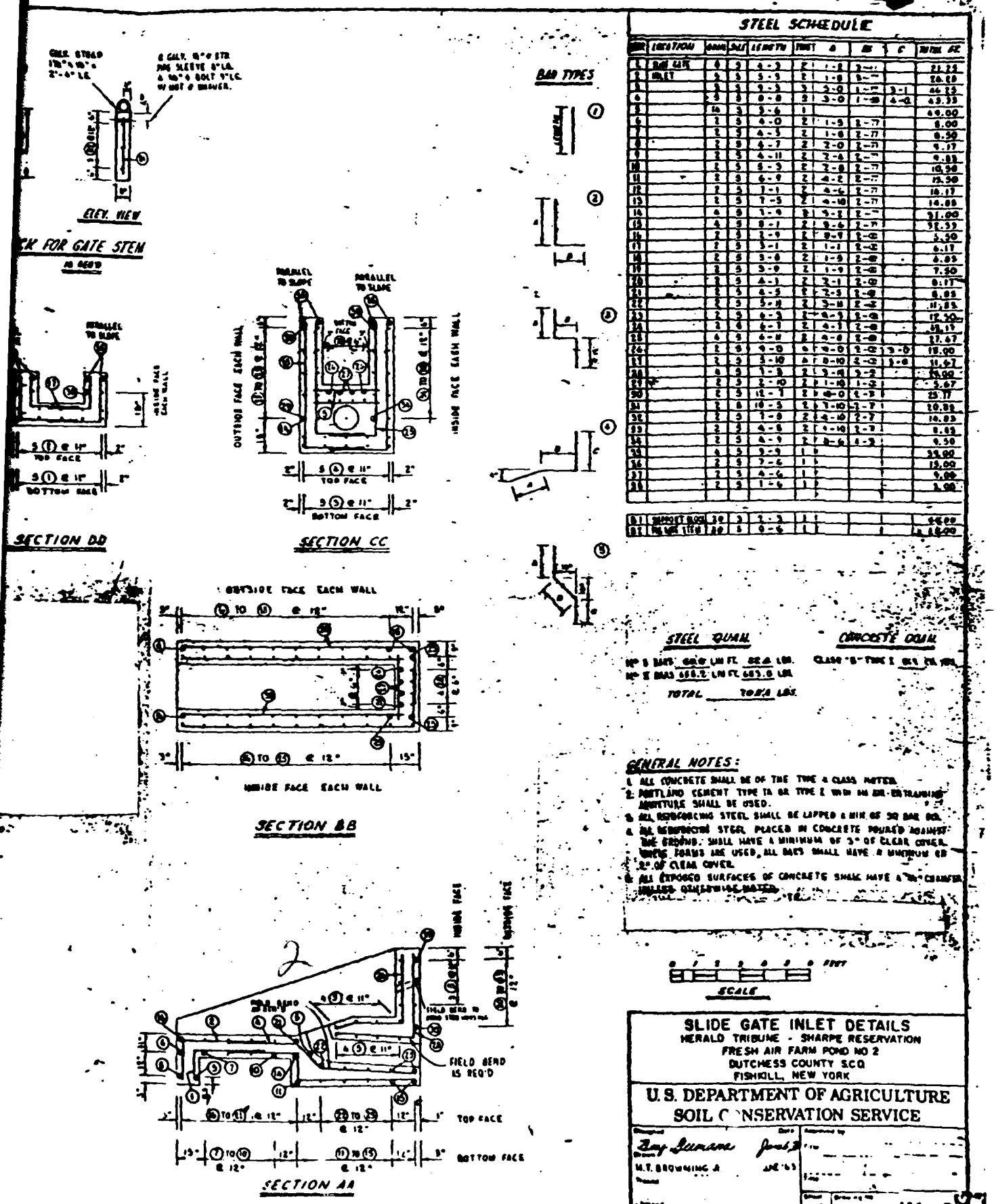
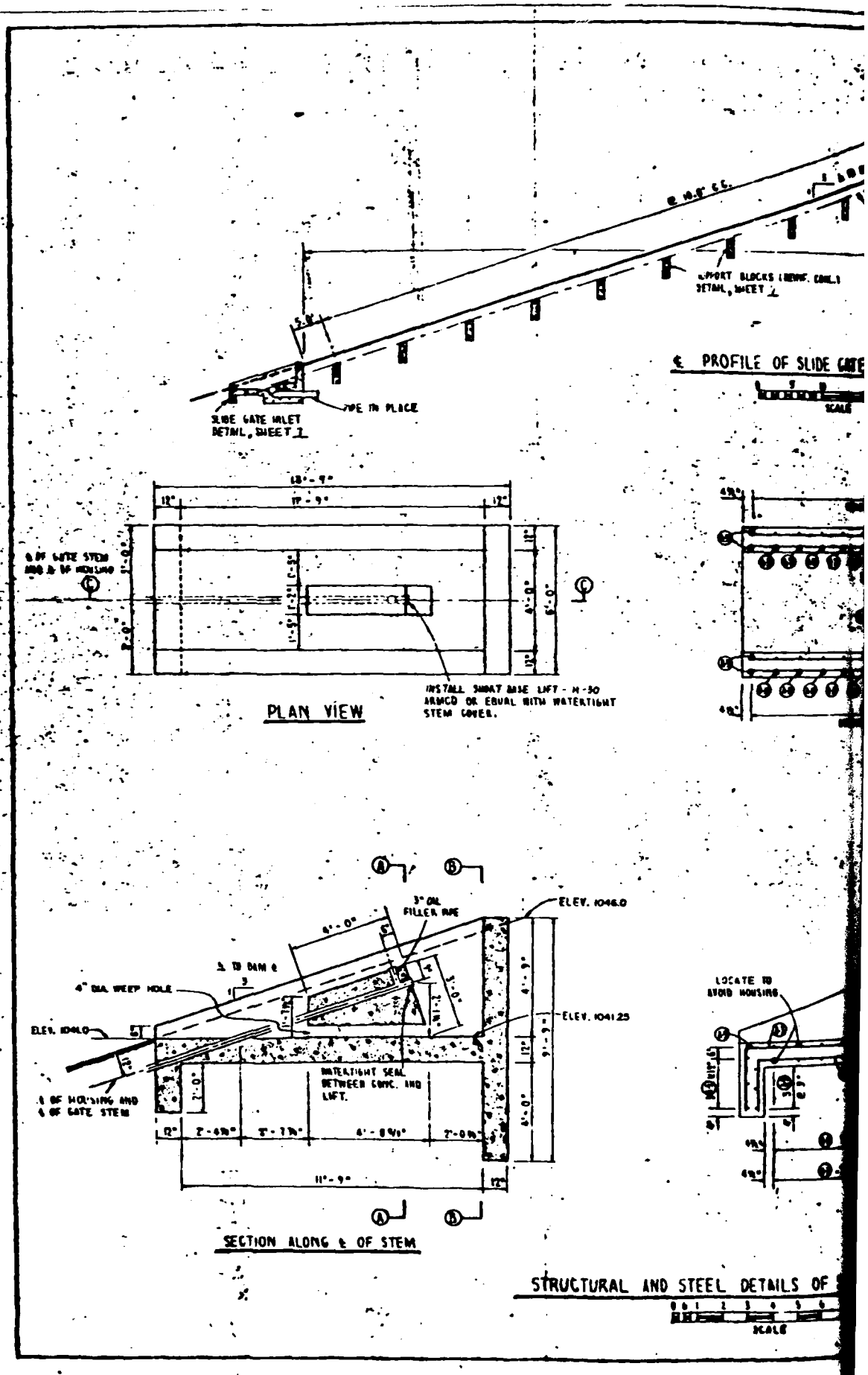
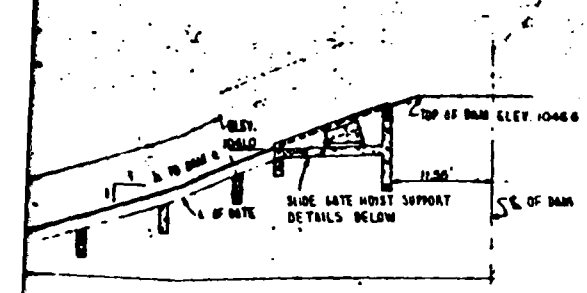

ELEV. VIEW
CK FOR GATE STEM
SECTION DD
SECTION CC
SECTION BB
SECTION AA
BAR TYPES
OUTSIDE FACE EACH WALL
INSIDE FACE EACH WALL
TOP FACE
BOTTOM FACE
FIELD BEND IS REQ'D
STEEL SCHEDULE
STEEL QUAN.
CONCRETE QUAN.
GENERAL NOTES:
1. ALL CONCRETE SHALL BE OF THE TYPE A CLASS MIXTURE.
2. PORTLAND CEMENT TYPE IA OR TYPE I WITH AIR-ENTRAINING MIXTURE SHALL BE USED.
3. ALL REINFORCING STEEL SHALL BE LAPPED A MIN. OF 30 BAR DIA.
4. ALL REINFORCING STEEL PLACED IN CONCRETE POURED AGAINST THE GROUND, SHALL HAVE A MINIMUM OF 3" OF CLEAR COVER. WHERE FORMS ARE USED, ALL BARS SHALL HAVE A MINIMUM OF 2" OF CLEAR COVER.
5. ALL EXPOSED SURFACES OF CONCRETE SHALL HAVE A 3/4" CHAMFER UNLESS OTHERWISE NOTED.
SCALE
SLIDE GATE INLET DETAILS
HERALD TRIBUNE - SHARPE RESERVATION
FRESH AIR FARM POND NO 2
DUTCHESS COUNTY S.C.D.
FISHKILL, NEW YORK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NY - 155 - P

Plate 10

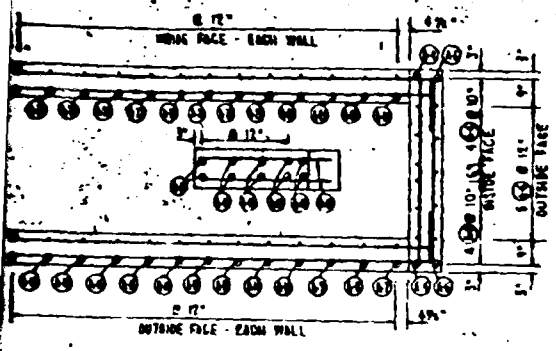

SLIDE GATE INLET DETAIL, SHEET 1
PIPE IN PLACE
SUPPORT BLOCKS (REINF. CONC.) DETAIL, SHEET 1
℄ PROFILE OF SLIDE GATE
SCALE
PLAN VIEW
INSTALL SHOAT BASE LIFT - H-50 ARMCO OR EQUAL WITH WATERTIGHT STEM COVER.
3" DIA. FILLER PIPE
ELEV. 1046.0
4" DIA. WEEP HOLE
ELEV. 1041.25
WATERTIGHT SEAL BETWEEN CONC. AND LIFT.
LOCATE TO AVOID HOUSING
SECTION ALONG ℄ OF STEM
STRUCTURAL AND STEEL DETAILS OF
SCALE



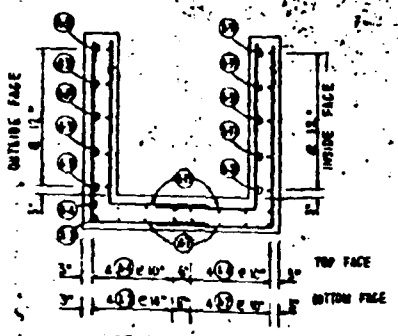
ERS (REINF. CONC.)
NT 2

E OF SLIDE GATE FOR POND DRAIN

0 5 10 20 30 FEET
SCALE



PLAN VIEW

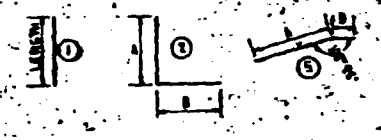


SECTION B-B

STEEL SCHEDULE

MARK	LOCATION	BARS/SIZE	LENGTH	TYPE	A	B	C	TOTAL FT.
A-1	HOIST SUPPORT	8 # 6	8-10	2	2-10	6-10		78.67
A-2		8 # 5	10-10	1	4-8	6-8		86.67
A-3		8 # 5	10-0	2	2-7	7-8		80.00
A-4		8 # 5	11-7	2	4-9	6-10		97.67
A-5		77 # 5	5-0	1				248.08
A-6		1 # 5	9-3	4				64.75
A-7		2 # 5	8-10	2	5-5	3-7		17.67
A-8		2 # 5	8-6	2	4-11	3-7		17.00
A-9		2 # 5	8-2	2	4-7	3-7		16.33
A-10		2 # 5	7-10	2	4-3	3-7		15.67
A-11		2 # 5	7-6	2	3-11	3-7		15.00
A-12		2 # 5	7-2	2	3-7	3-7		14.33
A-13		2 # 5	6-10	2	3-3	3-7		13.67
A-14		2 # 5	6-6	2	2-11	3-7		13.00
A-15		2 # 5	6-2	2	2-7	3-7		12.33
A-16		2 # 5	5-10	2	2-3	3-7		11.67
A-17		2 # 5	5-6	2	1-11	3-7		11.00
A-18		2 # 5	5-2	2	1-7	3-7		10.33
A-19		2 # 5	7-10	2	4-11	3-0		15.67
A-20		2 # 5	7-6	2	4-6	3-0		15.00
A-21		2 # 5	7-2	2	4-2	3-0		14.33
A-22		2 # 5	6-10	2	3-10	3-0		13.67
A-23		2 # 5	6-6	2	3-6	3-0		13.00
A-24		2 # 5	6-2	2	3-2	3-0		12.33
A-25		2 # 5	5-10	2	2-10	3-0		11.67
A-26		2 # 5	5-6	2	2-6	3-0		11.00
A-27		2 # 5	5-2	2	2-2	3-0		10.33
A-28		2 # 5	4-10	2	1-10	3-0		9.67
A-29		2 # 5	4-6	2	1-6	3-0		9.00
A-30		2 # 5	4-2	2	1-2	3-0		8.33
A-31		6 # 5	15-9	6	2-0	11-9		63.00
A-32		2 # 5	6-2	2	1-7	4-7		12.33
A-33		2 # 5	9-2	2	1-7	7-7		18.33
A-34		2 # 5	12-2	2	1-7	10-7		24.33
A-35		2 # 5	14-11	2	1-7	13-4		29.83
A-36		2 # 5	13-0	1				26.00
A-37		2 # 5	10-6	1				21.00
A-38		2 # 5	7-6	1				15.00
A-39		2 # 5	4-6	1				9.00
A-40		2 # 5	5-1	6	5-6	1-7		40.16
A-41		2 # 5	3-6	1				7.00
A-42		2 # 5	4-0	1				8.00
A-43		1 # 5	4-3	1				8.50
A-44		2 # 5	4-10	2	3-3	1-7		9.66
A-45		2 # 5	4-6	2	2-11	1-7		9.00
A-46		2 # 5	4-2	2	2-7	1-7		8.33
A-47		2 # 5	3-10	2	2-3	1-7		7.66

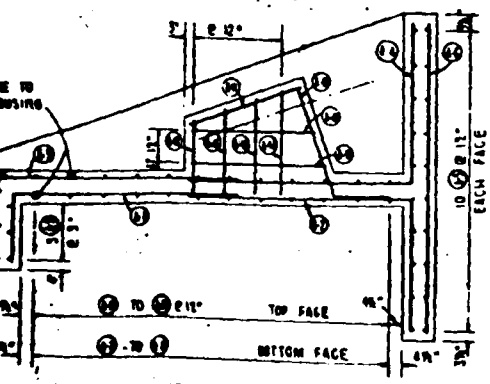
BAR TYPES



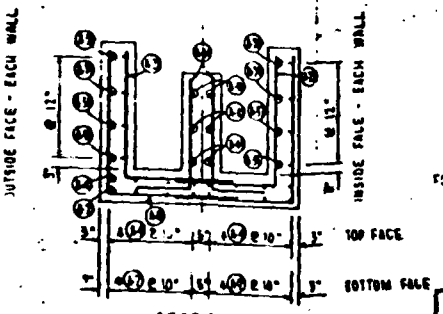
STEEL AND CONCRETE IN SLIDE GATE HOIST SUPPORT

STEEL: NO. 6 BARS 1142.2 LIN. FT. 852.0 LBS.

CONCRETE: CLASS "B" TYPE I 9.4 CU. YDS.



SECTION C-C



SECTION A-A

FOR GENERAL NOTES SEE SHEET 10 OF 11.

ETAILS OF SLIDE GATE HOIST SUPPORT

0 5 6 7 8 FEET
SCALE

SLIDE GATE HOIST SUPPORT DETAILS
HERALD TRIBUNE SHARPE RESERVATION
FRESH AIR FARM POND NO 2
DUTCHESS COUNTY SCD
FISHKILL, NEW YORK

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Roy Summa Jr. 3
B.B. MORGAN JUNE '63
Jan Cook Jan 63

Sheet 11 of 11

NY - 355 - P

Plate 11

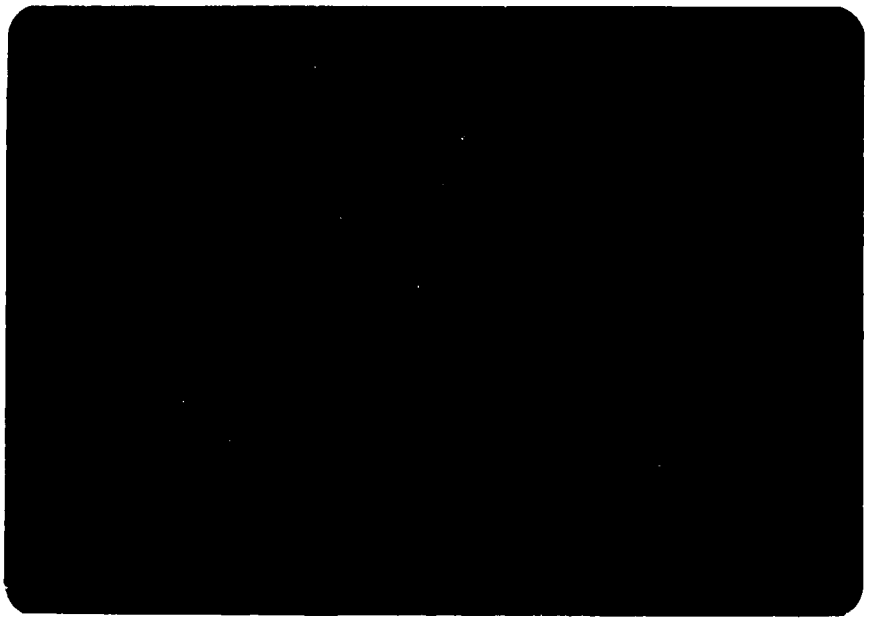
APPENDIX B

PHOTOGRAPHS

1. VIEW OF CREST LOOKING EASTWARD.

2. UPSTREAM SLOPE VIEWED FROM RIGHT ABUTMENT.

3. UPSTREAM SLOPE VIEWED FROM LEFT ABUTMENT.



4. VIEW OF DOWNSTREAM SLOPE.

5. VIEW OF SERVICE SPILLWAY.

6. SERVICE SPILLWAY STILLING BASIN.

7. CONCRETE INTAKE STRUCTURE FOR SERVICE SPILLWAY. NOTE TRASH RACK.

8. AUXILIARY SPILLWAY CHANNEL, LOOKING UPSTREAM.

9. VIEW OF LOW LEVEL OUTLET PIPE (LEFT) AND SEEPAGE DRAIN PIPE (RIGHT).

10. CONCRETE GATE STRUCTURE FOR LOW LEVEL OUTLET.

11. UPSTREAM SLOPE. NOTE CONDITION OF RIPRAP.

12. DOWNSTREAM CHANNEL OF SERVICE SPILLWAY. NOTE VEGETATION AND FALLEN TREES.

13. SMALL DEPRESSION LOCATED ON DOWNSTREAM SLOPE.

APPENDIX C

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Tribune Fresh Air Fund

Fed. I.D. # NY726 DEC Dam No. 212D-3254

River Basin Lower Hudson Valley River Basin

Location: Town Fishkill County Dutchess

Stream Name Fishkill Creek

Tributary of —

Latitude (N) 41°30' 30" Longitude (W) 73°52' 24"

Type of Dam Earthfill

Hazard Category High

Date(s) of Inspection April 24, 1980

Weather Conditions Sunny; 50-60°F

Reservoir Level at Time of Inspection 3/4" above Spillway level

b. Inspection Personnel Mr. Harvey Feldman, Mr. Albert DiBernardo

c. Persons Contacted (Including Address & Phone No.)

Mr. William Seitz

Sharpe Reservation

Fishkill, New York 12524

(914) 897-4080 (office); (914) 897-4107 (home)

d. History:

Date Constructed 1966 Date(s) Reconstructed

Designer United States Soil Conservation Service

Constructed By

This information in accordance with inventory forms issued prior to investigation

Owner Fresh Air Fund, New York, New York.

2) Embankment

a. Characteristics

(1) Embankment Material Core material impervious sandy silty-clay; shell material is a clayey sand and gravel, according to drawings.

(2) Cutoff Type UNKNOWN, however probably impervious core trench

(3) Impervious Core Sandy silty clay according to dwgs.

(4) Internal Drainage System 8" corrugated steel pipe set in 2' wide by 5' high granular drain located on d/s slope extending from service spillway to low level outlet discharge point.

(5) Miscellaneous Downstream berm was constructed only to its present height because height of dam was lowered during construction, as reported by Mr. Seitz.

b. Crest

(1) Vertical Alignment Good, except for vehicular traffic depression (rutting) at downstream crest side.

(2) Horizontal Alignment Both legs of dam are generally good.

(3) Surface Cracks None observed.

(4) Miscellaneous Along crest, planted bramble bushes should be removed or cut. Also minor depression, caused by paddling, should be filled.

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1:3

(2) Undesirable Growth or Debris, Animal Burrows Reeds and shrubs should be removed from riprap. Floating debris at water edge should be removed.

(3) Sloughing, Subsidence or Depressions Minor localized sloughings along entire slope. No subsidence or depressions WERE OBSERVED.

(4) Slope Protection Good condition; durable rock Riprap appears to extend about 20' into reservoir and 15' from crest edge.

(5) Surface Cracks or Movement at Toe Could not be detected - full reservoir

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:2½

(2) Undesirable Growth or Debris, Animal Burrows Bushes, especially on berm slope, should be removed or cut. At 100' right of spillway, 2 to 4' ϕ depressions in rockfill caused by subsidence or erosion

(3) Sloughing, Subsidence or Depressions See Above -

(4) Surface Cracks or Movement at Toe NONE -

(5) Seepage Dampness and surface softness detected along top of berm in vehicular tracks in area located approximately 200' to right of low level outlet and extending 200 lt. Wetness also noted at toe of berm on right side, possibly due to runoff along toe contact.

(6) External Drainage System (Ditches, Trenches, Blanket) - NONE -

(7) Condition Around Outlet Structure generally good condition, except for fallen trees which should be removed.

(8) Seepage Beyond Toe None -

e. Abutments - Embankment Contact

Roadway at Right Abutment is approx. 6" below crest elevation, will act as auxilliary spillway with discharge occurring along toe of embankment

5) Reservoir

a. Slopes No signs of slope instability. Reservoir slopes are relatively flat.

b. Sedimentation No indication of excessive sedimentation; clear lake water, minor debris.

c. Unusual Conditions Which Affect Dam NONE observed

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Camp site area, camp access roads, camp operations buildings, and several private homes.

b. Seepage, Unusual Growth Crossable marsh - wooded located for approximately 0.5 mile downstream.

c. Evidence of Movement Beyond Toe of Dam None observed.

d. Condition of Downstream Channel Wooded, with fallen trees & other debris.

7) Spillway(s) (Including Discharge Conveyance Channel)

a. General 36" reinforced concrete pipe, with concrete intake structure containing steel angle iron trash rack; Rip rap plunge pool.

b. Condition of Service Spillway generally good. No evidence of erosion around pipe or concrete cradle. Riser in good condition except for damaged angle irons and boulders at riser floor. Concrete pipe is in very good shape.

(1) Erosion at Contact NONE —

(2) Seepage Along Contact NONE —

3) Drainage System

a. Description of System Filter and drain as described above.

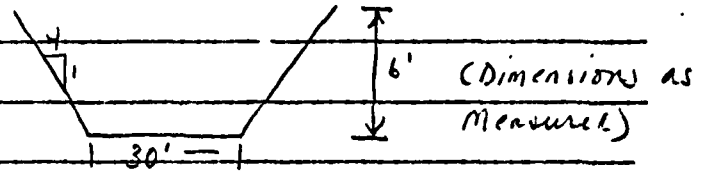
b. Condition of System Appears to be operating since flow at discharge point was measurable.

c. Discharge from Drainage System At discharge point, flow was about 1/2 gpm.

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

Exposed rock located to the left of the service spillway was marked at El. 1024.1 ft.

c. Condition of Auxiliary Spillway Spillway channel contained brush and trees. Boulders or bearock are exposed at base and left side of channel



(Dimensions as Measured)

d. Condition of Discharge Conveyance Channel Contains numerous shrubs and trees, with debris.

8) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit ____ Other ____

Material: Concrete ____ Metal ✓ Other ____

Size: 12" outside diameter Length 90 ft (from dwgs.)

Invert Elevations: Entrance ____ Exit ____

Physical Condition (Describe): Unobservable ✓

Material: Observable end - GOOD

Joints: Unknown Alignment Unknown

Structural Integrity: Exposed pipe at discharge point relatively good condition except for deterioration of bituminous coating.

Hydraulic Capability: Appears to be good during the short time that the gate was opened for this inspection

Means of Control: Gate ____ Valve ✓ Uncontrolled ____

Operation: Operable ✓ Inoperable ____ Other ____

Present Condition (Describe): Leaks of oil and/or water occurred from stem at hoist during operation of gate. Had difficult time closing gate after opened, but realized gate slid past original closed position

9) Structural

a. Concrete Surfaces Not Applicable (NA)

b. Structural Cracking N.A. —

c. Movement - Horizontal & Vertical Alignment (Settlement) N.A. —

d. Junctions with Abutments or Embankments N.A. —

e. Drains - Foundation, Joint, Face N.A. —

f. Water Passages, Conduits, Sluices N.A. —

g. Seepage or Leakage N.A. —

h. Joints - Construction, etc. N.A.

i. Foundation N.A.

j. Abutments N.A.

k. Control Gates N.A.

l. Approach & Outlet Channels N.A.

m. Energy Dissipators (Plunge Pool, etc.) N.A.

n. Intake Structures N.A.

o. Stability N.A.

p. Miscellaneous N.A.

APPENDIX D

HYDROLOGIC DATA AND COMPUTATIONS

TAMS

Job No. 1551-05 | Sheet 1 of 4

Project: PHASE 1 INSPECTION | Date 08/03/80

Subject: Rainfall distribution | By DLC

Fresh Air Fund DAM No. 2 | Ch'k. by

A = 152

	Acc %	Δ %	Δ Rain depth "	Q = ins/hr × A Q_G	Q_L	Q_r
0	0	0		0	0	
6	2.68	2.68	.6"	91	32	123
12	13.42	10.74	2.41	370	124	494
13	21.65	8.23	1.84	280	95	375
14	31.50	9.85	2.21	335	114	449
15	43.80	12.3	2.76	420	142	562
16	75.12	31.32	7.02	1067	363	1430
17	86.67	11.55	2.59	394	134	528
18	95.70	9.03	2.02	307	105	412
24	100	4.3	0.96	146	50	196

24 HR PMP for basin ~ 33"

Less Hydrologic loss (20%) ~ 26.4"

Less [illegible] losses ~ 22.4 in.

LAND AREA 155.4 Acres.

No losses for Rainfall on 41.6 acre Lake

Expressed Hydrograph (INFLOW)

HR	Q		
0	0	13	375
1	3	14	449
2	9	15	562
3	18	16	1430
4	25	17	528
5	31	18	412
6	38	19	86
7	50	20	60
8	60	21	32
9	72	22	12
10	87	23	5
11	102	24	1
12	123		

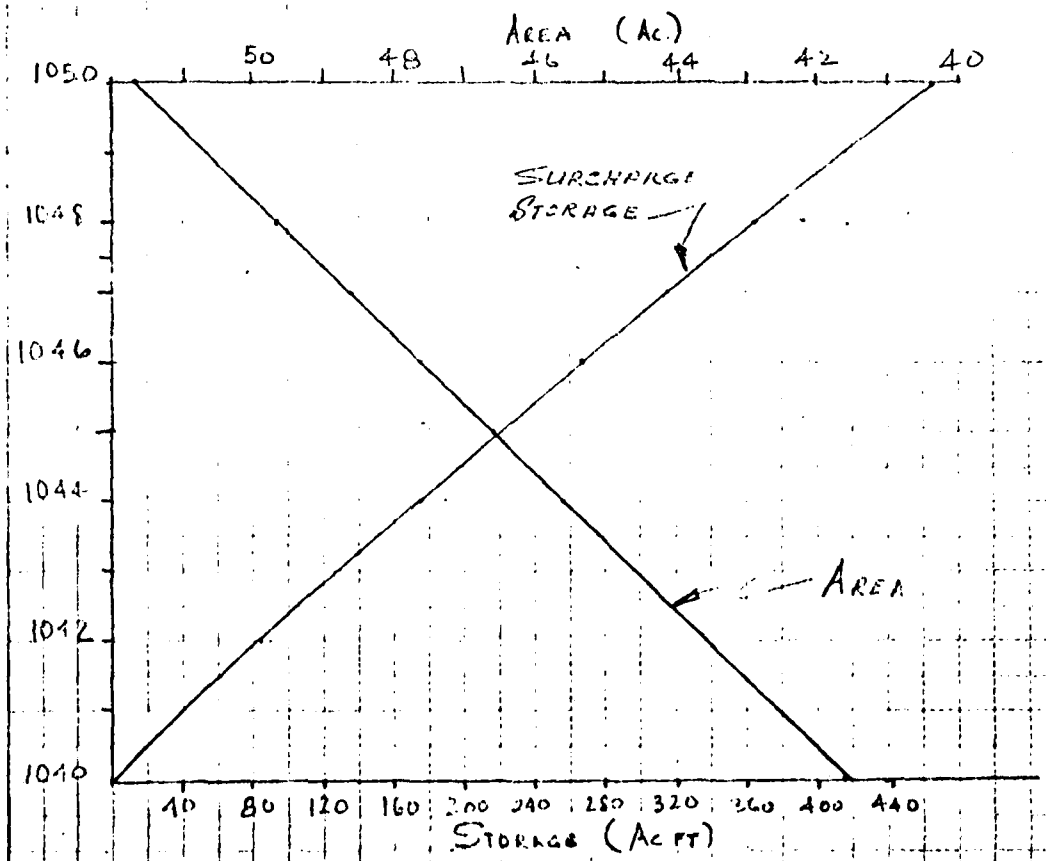
TAMS

Job No.
Project PHASE 1 INSPECTION
Subject FRESH AIR FUND DAM # 2
LOCATION LAT. 41°30' LONG 73° 52'

Sheet 2 of
Date MAY 1 1980
By D.L.C
Ch'k. by

LAKE AREA @ 1040 CONTOUR 1045 1050

10317 181.5 m² 2172 203.2 m² 4.437 225.4 m²
8502 41.6 acres 0140 46.6 acres 2183 51.7 acres



TAMS

Job No. 1551-05 | Sheet 3 of ____

Project PHASE 1 INSPECTION | Date MAY 1 1980

Subject FRESH AIR FLOOD DAM No. 2 | By DLC

SURCHARGE STORAGE COMPUTATION | Ch'k. by ____

EL (MSL)	Δh Ft	AREA Ac	$\bar{A}$	ΔSTORAGE Ac Ft	SURCHARGE STORAGE Ac Ft
1040	0	41.6			0
	2		42.58	85.16	
1042		43.55			85.16
	2		44.55	89.10	
1044		45.6			174.32
	1		46.1	46.1	
1045		46.6			220.42
	1		47.1	47.1	
1046		47.6			267.52
	2		48.62	[illegible]	
1048		49.65			364.76
	2		[illegible].63	101.36	
1050		51.7			466.12

AT EL 1000 AREA ≈ 0

TAMS

Job No. 1551-05 | Sheet 4 of 4

Project FRESH AIR FUND DAM No. 2 | Date [illegible]

Subject HYDROLOGIC / HYDRAULIC Computations | By DLC

Ch'k. by

Aux Spillway Eq L = 31.5

EL	H	H_d	Q_S	C = 2.624 Q_{DAM}	Q_T
1040	0	8	120/0	0	10
1042	2	10	135 / 74	233	310
1044	4	12	150 / 550	660	810
1047	7	15	165	1530	1700
1050	10	18	180	2610	2790

Crest Riser

L=10 H=3.0 ~ Q=7[illegible]
4.0 Q 210 L=5 H=2 Q=40

[illegible] Q [illegible] riser to [illegible] 135 cfs [illegible] opening of 36" dia. RCP.

DAM EL. - 1047

DAM LENGTH - 100 FT

```
**************************************
HEC-1 FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
LAST MODIFICATION       16 FEB 79
**************************************
     1    X1       NEW YORK HERALD TRIBUNE FRESH AIR FUND POND  PHASE 1 INSPECTION
                   WITH HEC-1 ANALYSIS
                   BY SCHNEIDER AND ARCHITECTS   MAY 1980
                        1    0    3    0    0    0    0    0    0
          J1
          J        1    2    1
          J1       1   .5
          K        1    1
          K1       INFLOW HYDROGRAPH
          K        -1   0.0
     11   X        2    1    15   25   31   39   50   60   72   87
          X        1    1    775  449  562  1430 528  412  86   60
          X        2    1    5    1    0
          K        1    1
          K1       ROUTED HYDROGRAPH AT DAM
          Y                         1    1
          Y1       1                                594.        -1
          Y6       1    1    1042 1044 1047 1050
          Y5       1    1    310  410  1700 2790
          Y6       1    1    479  765  911  1060
     21   Y6       1    1    1041 1042 1044 1047 1050
          K        1    1
          K1       1.47 3.47 1.5  11.0
          K        1    2
          K*            CHANNEL ROUTING    TOP OF DAM
          Y                         1    1
          Y1       1
          Y6       .4   .4   .04  775  810  500  .09
          Y7       1    1    1.1  600  100  790  250  780  350  775
          Y7       43   7    667  790  560  800  670  810
     31   K        1    3
          K1            CHANNEL ROUTING    REACH   2 TO 3
          Y                         1    1
          Y1       1
          Y6       .04  .04  .04  707  740  1500 .03
          Y7       740  6590 630  5070 720  5760 710  6030 707
          Y7       71   6200 720  6330 730  6470 740
          K        1    4
          K1            CHANNEL ROUTING    REACH  3 TO 4
          Y                         1    1
     41   Y1       1
          Y6       .4   .04  .04  626  660  1750 .0451
          Y7       443  2750 650  2390 640  2480 630  2500 628
          Y7       [illegible] 2440 640  2670 650  2710 670
          K        99
```

			640	2690	630	2500	628
		2670	650	2710	670		

REVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT 1
ROUTE HYDROGRAPH TO 1
ROUTE HYDROGRAPH TO 2
ROUTE HYDROGRAPH TO 3
ROUTE HYDROGRAPH TO 4
END OF NETWORK

```
**************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION   26 FEB 79
**************************

RUN DATE [illegible]
TIME [illegible]

                    NEW YORK HERALD TRIBUNE FRESH AIR FUND POND  PHASE 1 INSPECTION
                    [illegible] RATIOS ANALYSIS
                    TAMS ENGINEERS AND ARCHITECTS   MAY 1980

                                    JOB SPECIFICATION
                    NR     NHR    NMIN    IDAY     IHR    IMIN   METRC    IPLT    IPRT   NSTAN
                     5       1       0       0       0       0       0       0       0       0
                                   JOPER     NWT   LROPT   TRACE
                                       5       0       0       0

                              MULTI-PLAN ANALYSES TO BE PERFORMED
                                NPLAN= 1 NRTIO= 2 LRTIO= 1
                    RTIOS=    1.00     .50

********** ********** ********** ********** **********

                                SUB-AREA RUNOFF COMPUTATION

                    INFLOW HYDROGRAPH

                                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                    1       0       0       0       0       0       0       0       0

                                         HYDROGRAPH DATA
                    IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                       -1       0     .31    0.00     .31    0.00   0.000       0       0       0

                                         INPUT HYDROGRAPH
                      3.      9.     18.     25.     31.     38.     50.     60.     72.     87.
                    102.    175.    575.    449.    562.   1430.    528.    412.     86.     60.
                     22.     12.      5.      1.      0.      0.      0.      0.      0.      0.

                                   PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                            CFS    1430.     602.     190.     152.       4569.
                            CMS      40.      17.       5.       4.        129.
                         INCHES              1[illegible].30    23.15    23.15       23.15
                             MM             464.77   587.93   587.93      587.93
                          AC-FT              29[illegible].     378.     378.        378.
                       THOUS CU-M            36[illegible].     466.     466.        466.

                                HYDROGRAPH AT STA     1 FOR PLAN 1, RTIO 1
                      3.      9.     18.     25.     31.     38.     50.     60.     72.     87.
                    102.    175.    575.    449.    562.   1430.    528.    412.     86.     60.
                     22.     12.      5.      1.      0.      0.      0.      0.      0.      0.

                                   PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
```

		190.	152.		4569.
		17.	5.		129.
		23.1	23.		23.15
	464.77	587.93	587.93		587.93
AC-FT	295.	378.	378.		378.
INCHES CU M	369.	466.	466.		466.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

1.	2.	10.	25.	31.	39.	50.	60.	72.	87.
103.	155.	775.	449.	562.	1430.	528.	417.	86.	60.
24.	12.	5.	1.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1430.	462.	190.	152.	4569.
CMS	41.	13.	5.	4.	129.
INCHES		16.70	23.15	23.15	23.15
MM		464.77	587.93	587.93	587.93
AC-FT		295.	378.	378.	378.
THOUS CU M		364.	466.	466.	466.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

1.	2.	5.	15.	19.	19.	25.	30.	36.	44.
51.	82.	155.	225.	291.	715.	264.	206.	43.	30.
15.	8.	3.	1.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	715.	201.	55.	76.	2284.
CMS	20.	6.	2.	2.	65.
INCHES		9.15	11.57	11.57	11.57
MM		232.35	293.97	293.97	293.97
AC-FT		149.	189.	189.	189.
THOUS CU M		184.	233.	233.	233.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED HYDROGRAPH AT DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	594.	-1

STAGE	1040.00	1041.00	1042.00	1044.00	1047.00	1050.00
FLOW=	0.00	0.00	310.00	210.00	1700.00	2790.00
CAPACITY=	0.	594.	679.	749.	910.	1060.
ELEVATION=	1040.	1041.	1042.	1044.	1047.	1050.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1040.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1047.0	3.1	1.5	1100.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1.	2.	4.	7.	14.	20.	26.	34.	42.	52.
72.	77.	103.	117.	77.	535.	702.	615.	477.	325.
247.	195.	141.	105.	79.	57.	42.	31.	23.	17.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

CHANNEL ROUTING TOP OF DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	0	0	0

ROUTING DATA

[illegible]	[illegible]	AVG	IPRS	ISAME	IOPT	IPMP	LSTR
[illegible]	0.00	0.00	1	1	0	0	0

NSTDL	NSTEL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

JZ(1)	[illegible]	[illegible]	ELEVT	ELMAX	ELMIN	SEL
.0450	[illegible]	[illegible]	775.	810.	500.	.09000

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

[illegible]	[illegible]	[illegible]	[illegible]	790.00	790.00	750.00	780.00	350.00	775.00	
440.	[illegible]	[illegible]	790.	590.00	590.00					

INFLOW	[illegible]	.24	2.94	6.63	11.20	16.47	22.44	29.11	36.48	44.46
	[illegible]	61.66	70.96	80.65	90.73	100.91	111.14	121.40	131.70	142.05
OUTFLOW	[illegible]	[illegible]	4224.79	13522.50	29536.18	51784.11	80333.48	115513.69	157678.03	212632.91
	376[illegible].17	347[illegible]4.17	427[illegible]7.29	514[illegible].26	612283.50	719976.14	835447.58	958404.78	1088605.00	1225841.73
STAGE	775.[illegible]	775.54	775.64	780.57	787.37	784.21	786.05	787.89	789.74	791.58
	793.42	795.26	797.11	798.95	800.79	802.63	804.47	806.32	808.16	810.00
FLOW	[illegible]	[illegible]	4224.79	13522.50	29536.18	51784.11	80333.48	115513.69	157678.03	212632.91
	376[illegible].17	347[illegible]4.17	427[illegible]7.29	514[illegible].26	612283.50	719976.14	835447.58	958404.78	1088605.00	1225841.73

STATION 2, PLAN 1, RTIO 1

OUTFLOW

2.	1.	6.	9.	15.	19.	26.	33.	42.	51.
[illegible]	[illegible]	121.	195.	277.	529.	704.	615.	480.	326.
24.	[illegible]	140.	135.	79.	57.	43.	31.	23.	17.

STOR

[illegible]	[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.
[illegible]	[illegible]	[illegible]	0.	0.	1.	1.	1.	0.	0.
[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

775.	775.[illegible]	775.0	775.0	775.0	775.1	775.1	775.1	775.1	775.1
775.[illegible]	775.[illegible]	775.7	775.5	775.7	776.4	776.9	776.7	776.3	775.9
775.[illegible]	775.5	775.4	775.[illegible]	775.2	775.2	775.1	775.1	775.1	775.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	704.	486.	186.	150.	4515.
CMS	20.	14.	5.	4.	128.
INCHES		14.77	22.67	22.97	22.97
MB		575.27	575.72	580.98	580.98
AC-FT		241.	370.	373.	373.
THOUS CU M		297.	456.	460.	460.

MAXIMUM STORAGE = 1.

MAXIMUM STAGE IS [illegible]

STATION 2, PLAN 1, RTIO 2

									4.	129.
									22.	97
									91.	99
					241.	370.	373.			373.
					297.	456.	460.			460.

MAXIMUM STORAGE = 1.

MAX UP STAGE IS 775.9

STATION 2, PLAN 1, RTIO 2

OUTFLOW

1.	1.	3.	4.	7.	9.	13.	16.	21.	26.
[illegible]	[illegible]	60.	98.	139.	231.	300.	283.	242.	188.
14.	11.	53.	61.	45.	33.	25.	18.	13.	10.

STOR

1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

775.1	775.1	775.1	775.0	775.0	775.0	775.0	775.0	775.1	775.1
775.1	775.1	775.2	775.3	775.4	775.6	775.8	775.8	775.7	775.5
775.5	775.3	775.2	775.2	775.1	775.1	775.1	775.0	775.0	775.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	300.	231.	93.	75.	2253.
CMS	9.	7.	3.	2.	64.
INCHES		7.03	11.31	11.41	11.41
CM		178.60	287.27	289.90	289.90
MM-FT		115.	184.	186.	186.
THOUS CU M		141.	228.	230.	230.

MAXIMUM STORAGE = 0.

MAXIMUM STAGE IS 775.9

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

CHANNEL ROUTING' REACH 2 TO 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0400	.0400	.0400	707.0	740.0	1500.	.03000

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

5400.00	[illegible]	[illegible]	[illegible]	5760.00	720.00	5760.00	710.00	6000.00	707.00	
6100.00	710.00	[illegible]	720.00	6730.00	730.00					
STORAGE	[illegible]	124.37	166.31	228.85	260.83	296.95	335.19	375.60	418.08	462.13
	507.6[illegible]	554.74	607.29	653.35	704.52	755.88	807.39	859.04	910.85	962.81

OUTFLOW [illegible]

[illegible] 1500. [illegible]

PMFS [illegible] --STA ELEV STA ELEV--ETC
[illegible] 720.00 5760.00 710.00 6000.00 707.00
[illegible] 720.00

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	260.83	298.93	335.19	375.60	418.08	462.13
[illegible]	[illegible]	[illegible]	[illegible]	653.35	704.52	755.88	807.38	859.04	910.55	962.81

OUTFLOW	[illegible]	[illegible]	[illegible]	351941.51	398462.95	451100.96	509888.47	577915.12	655280.31
	[illegible]	[illegible]	[illegible]	1144463.12	1265642.09	1393197.54	1526965.97	1666804.77	1812587.88
[illegible]	[illegible]	[illegible]	[illegible]	713.21	715.65	715.68	717.42	719.16	720.39	722.63
	[illegible]	[illegible]	[illegible]	729.59	731.32	733.05	734.79	736.53	738.26	740.00
[illegible]	[illegible]	[illegible]	[illegible]	351941.51	398462.95	451100.96	509888.47	577915.12	655280.31
	[illegible]	[illegible]	[illegible]	1144463.12	1265642.09	1393197.54	1526965.97	1666804.77	1812587.88

STATION [illegible], PLAN 1, RTIO 1

OUTFLOW

[illegible]	[illegible]	[illegible]	[illegible]	14.	18.	27.	32.	43.	50.
[illegible]	74.	121.	135.	277.	525.	705.	615.	482.	326.
[illegible]	[illegible]	142.	105.	78.	57.	43.	31.	23.	17.

STOR

[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

707.	707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0
[illegible]	[illegible]	[illegible]	[illegible]	707.0	707.0	707.0	707.0	707.0	707.0
[illegible]	[illegible]	[illegible]	[illegible]	707.0	707.0	707.0	707.0	707.0	707.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	715.	486.	186.	150.	4514.
CMS	20.	14.	5.	4.	128.
INCHES		14.74	22.67	22.87	22.87
MM		375.30	575.72	580.97	580.97
AC-FT		241.	370.	373.	373.
THOUS CU M		297.	456.	460.	460.

MAXIMUM STORAGE = 0.

MAXIMUM STAGE IS [illegible]

STATION [illegible], PLAN 1, RTIO 2

OUTFLOW

[illegible]	[illegible]	4.	4.	9.	9.	14.	16.	22.	25.
[illegible]	7.	60.	97.	139.	230.	301.	283.	243.	189.
144.	11.	82.	61.	46.	33.	25.	19.	14.	10.

STOR

[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0
707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0
[illegible]	[illegible]	707.0	707.0	707.0	707.0	707.0	707.0	707.0	707.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	701.	231.	93.	75.	2253.
CMS	0.	7.	3.	2.	64.
INCHES		7.63	11.31	11.41	11.41
MM		175.59	287.27	289.90	289.90
AC-FT		115.	184.	186.	186.
THOUS CU M		141.	228.	230.	230.

STAGE

[illegible]	[illegible]	[illegible]	707.0	707.0	707.0	707.0	707.0	707.0	707.0
[illegible]	[illegible]	[illegible]	707.0	707.0	707.0	707.0	707.0	707.0	707.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	[illegible]	231.	93.	75.	2253.
CMS	9.	7.	3.	2.	64.
INCHES		7.03	11.31	11.41	11.41
MM		179.59	287.27	289.90	289.90
AC-FT		115.	184.	186.	186.
THOUS CU M		141.	228.	230.	230.

MAXIMUM STORAGE = 0.

MAXIMUM STAGE IS [illegible].

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HYDROGRAPH ROUTING

CHANNEL ROUTING REACH [illegible] TO 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
[illegible]	[illegible]	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

S(1)	S(2)	S(3)	ELEVT	ELMAX	RLNTH	SFL
[illegible]	[illegible]	[illegible]	[illegible]	660.0	1750.	.04510

CROSS SECTION DATA--STA,ELEV,STA,ELEV--ETC

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	640.00	2490.00	630.00	2500.00	628.00	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	450.00					

STORAGE	[illegible]	1.[illegible]	7.34	14.77	24.25	35.78	49.36	64.99	82.20	100.21
	119.[illegible]	139.[illegible]	159.03	180.24	202.29	225.25	249.12	273.91	299.61	326.22
OUTFLOW	[illegible]	746.71	2719.41	6192.04	12167.52	20549.32	31626.69	45669.75	65638.14	89240.38
	116[illegible].14	146[illegible].69	179404.51	215940.04	257173.40	302124.40	350732.46	403042.97	459109.91	518991.25
STAGE	[illegible]	[illegible].[illegible]	631.37	633.05	634.74	636.42	638.11	639.79	641.47	643.16
	644.84	646.53	648.21	649.89	651.58	653.26	654.95	656.63	658.32	660.00
FLOW	[illegible]	746.71	2719.41	6192.04	12167.52	20549.32	31626.69	45669.75	65638.14	89240.38
	116[illegible].14	146[illegible].69	179404.51	215940.04	257173.40	302124.40	350732.46	403042.97	459109.91	518991.25

STATION 4, PLAN 1, RTIO 1

OUTFLOW

5.	7.	9.	8.	14.	19.	26.	33.	41.	51.
[illegible]	[illegible]	115.	190.	271.	510.	707.	619.	487.	333.
[illegible]	103.	149.	108.	60.	58.	43.	32.	24.	17.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	2.	2.	3.	3.	2.	2.
1.	1.	1.	1.	0.	0.	0.	0.	0.	0.

STAGE

[illegible]	629.0	629.0	629.0	629.1	628.1	628.1	628.2	628.2	628.2
[illegible]	[illegible]	[illegible]	[illegible]	629.3	629.5	630.0	629.9	629.8	629.6
[illegible]	[illegible]	[illegible]	[illegible]	629.5	629.4	629.3	628.2	628.2	628.1	628.1

INFLOW

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	26.	33.	41.	51.
[illegible]	[illegible]	11[illegible]	[illegible]	271.	510.	707.	619.	487.	333.
[illegible]	1[illegible]	14[illegible]	10[illegible]	[illegible]	59.	43.	32.	24.	17.

STOR

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.	0.	0.	0.	0.
[illegible]	[illegible]	1.	1.	2.	2.	3.	3.	2.	2.
1.	1.	1.	1.	[illegible]	0.	0.	0.	0.	0.

STAGE

[illegible]	[illegible]	[illegible]	624.0	628.1	628.1	628.1	628.2	628.2	628.2
[illegible]	[illegible]	[illegible]	628.9	629.3	629.8	630.0	629.9	629.8	629.6
[illegible]	[illegible]	[illegible]	628.5	628.4	628.3	628.2	628.2	628.1	628.1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	[illegible]	[illegible]	186.	150.	4514.
CMS	20.	14.	5.	4.	128.
INCHES		14.2[illegible]	22.67	22.87	22.87
MB		[illegible]	575.73	580.96	580.96
AC-FT		341.	770.	773.	773.
THOUSAND CU M		297.	456.	460.	460.

MAXIMUM STORAGE = 3.

MAXIMUM STAGE IS [illegible]

STATION 4, PLAN 1, RTIO 2

OUTFLOW

[illegible]	[illegible]	[illegible]	4.	7.	9.	13.	16.	21.	25.
31.	7.	52.	95.	135.	221.	299.	287.	245.	194.
1[illegible].	135.	94.	63.	46.	34.	25.	19.	14.	10.

STOR

[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	[illegible]	0.	1.	1.	1.	2.	2.	1.	1.
[illegible]	1.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

[illegible]	[illegible]	[illegible]	628.0	628.0	628.0	628.1	628.1	628.1	628.1
[illegible]	[illegible]	[illegible]	629.5	629.7	629.1	629.4	629.4	629.2	628.9
[illegible]	[illegible]	628.4	628.7	628.7	628.2	628.1	628.1	628.1	628.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	299.	231.	93.	75.	2252.
CMS	9.	7.	3.	2.	64.
INCHES		7.[illegible]	11.31	11.41	11.41
MB		179.42	287.26	289.88	289.88
AC-FT		115.	184.	186.	186.
THOUSAND CU M		141.	228.	230.	230.

MAXIMUM STORAGE = 2.

MAXIMUM STAGE IS [illegible]

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PEAK FLOW [illegible] (ANNUAL PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 1.00	RATIO 2 .50
				RATIOS APPLIED TO FLOWS	
HYDROGRAPH AT	1	.1	1	1437.	715.
	(	.2)	(	40.49)(	20.25)(
ROUTED TO	1	.1	1	702.	703.
	(	.2)	(	19.89)(	8.50)(
ROUTED TO	[illegible]	.1	1	704.	703.
	(	.2)	(	19.92)(	8.51)(
ROUTED TO	3	.1	1	705.	704.
	(	.2)	(	19.96)(	8.52)(
ROUTED TO	4	.1	1	707.	299.
	(	.2)	(	20.01)(	8.46)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1043.00	1049.00	1047.00
STORAGE	594.	594.	910.
OUTFLOW	0.	0.	1700.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1[illegible]	[illegible]	749.	702.	0.00	17.00	0.00
.50	1[illegible]	[illegible]	474.	700.	0.00	17.00	0.00

PLAN 1 STATION 2

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	704.	776.9	17.00
.50	300.	775.8	17.00

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	705.	707.0	17.00
.50	301.	707.0	17.00

PLAN 1 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	707.	630.0	17.00
.50	299.	629.4	17.00

APPENDIX E

REFERENCES

References

1. "HEC-1 Flood Hydrograph Package for Dam Safety Investigations", U.S. Army Corps of Engineers, September 1978

2. "Lower Hudson River Basin Hydrologic Flood Routing Model", for New York District Corps of Engineers, Water Resources Engineers, January 1977

3. "Standard Project Flood Determination", EM-1110-0-1411, Army Corps of Engineers, Washington, D.C., Rev. 1965

4. "Probable Maximum Precipitation Estimates, United States East of the 105th Meridian", Hydrometeorological Report No. 51, National Weather Service, June 1978

5. "National Program of Inspection of Dams", Vol. 3, Department of the Army, Office of the Chief of Engineers, 1975

6. "Flood Hydrograph Analyses and Computations", EM-1110-2-1405, U.S. Army Corps of Engineers, August 1959

7. "Recommended Guidelines for Safety Inspection of Dams", Department of the Army, Office of the Chief of Engineers, Appendix D

8. "Physiographic Diagram of North America", by A. K. Lobeck, The Geographical Press, Columbia, N.J.

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